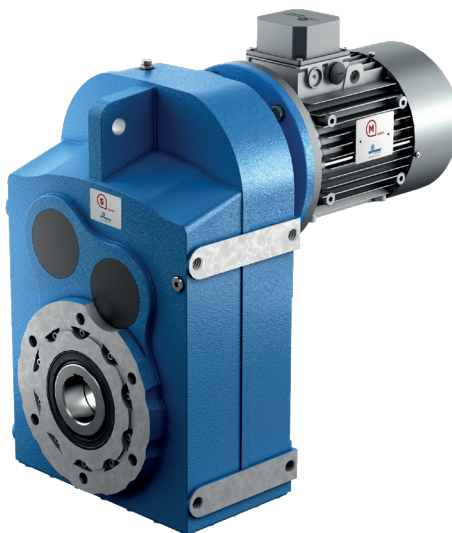


# TECHNICAL CATALOGUE



SN

## SHAFT MOUNTED GEARED MOTORS

IEC STANDARD



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Motovario® corporate philosophy aims to promote the company's brand and products at an international level with determination and transparency, while constantly striving to offer innovative solutions for satisfying and anticipating the demand of the market. Motovario® provides technologically advanced solutions in the transmission components field for industrial and civil applications worldwide.

#### The company

At Formigine, the heart of Modena's industrial district, Motovario® boasts a production plant spanning 50,000 m that employs 500 people.

1965 Foundation of Motovario

1998 Acquisition of Spaggiari Trasmissioni, an important brand in the mechanical technology sector.

2006 Motovario acquisition by a private investment fund managed by Synergo SGR, in order to guarantee its development and support its expansion throughout the world.

2014 Acquisition of Pujol.

2015 Acquisition by TECO.

At the core of Motovario® lies an evolved production process based on technological solutions that convert power into movement. Motovario® is at the heart of the production processes that drive industries worldwide. Quality and reliability are the company's fundamental assets. Motovario® is present throughout the world with branches in France, Spain, Germany, England, China, the United States and India. The sales network and customer service guarantee immediate and high-quality support to all customers. Qualified assembly centres are present, in Italy, Australia, Benelux, Bulgaria, China, Finland, France, India, Ireland, Israel, Malaysia, Poland, Portugal, South Korea, Spain, Sweden, Turkey, United Kingdom, Ukraine and USA. The company is able to offer a wide range of products: speed variators, right-angle, helical bevel, shaft-mounted, worm gear reducers and geared motors, electric motors, inverter and inverter drives. Maximum quality and precision are ensured by the cutting-edge technologies implemented in the production process. 170 numerical control machines, served by LGV lines for storage in automated warehouses, ensure a high standard of efficiency for the Motovario® production department. The highly automated assembly lines are supported by a specific computerised system. The process statistical control system manages the production process to avoid rejects, by enabling the operator to monitor all the processing phases. The annealing, tempering, hardening and carburizing treatments are carried out inside the plant. The plant operates on a 24-hour basis, including holidays. Reliability, resilience and versatility are the distinctive features of Motovario® products, the most qualified solution to any power transmission requirement.

#### Main fields OF APPLICATIONS

- Mechanical-electromechanical industry (car washing, pumps, barriers & automatic doors, circuit breakers)
- Ceramic industry (ovens, press feeding systems)
- Food, farming, oenology industry
- Wood, marble, glass industry
- Packaging & bottling industry
- Textile, shoes, leather industry
- Transport, logistic industry
- Construction industry
- Milling, animal husbandry, flower industry
- Machine tools and steel industry
- Mining, quarry, cement industry
- Energy industry (solar, nuclear, biomass, wind)
- Amusement industry (theatres, leisure parks, kiddy rides)
- Chemical & pharmaceuticals industry
- Paper & printing industry
- Plastic & rubber industry
- Telecommunications industry (satellite orientation systems, military radar)
- Engineering and consultant companies

### Certifications

Our products can be manufactured to conform with the ATEX Directive 2014/34/UE. In addition, the safety and quality of our motors, geared motors and motovariators is guaranteed by the EAC (EurAsian Conformity) certification, an essential requirement for products exported to the Russian Federation. Our motors are UL certified, which guarantees their safety and quality requirements for the North American market.

### Quality CONCEPT

Motovario® has obtained the quality certification renewal of its production system in conformity to the UNI EN ISO 9001:2008 standard. This internationally recognised certification acknowledges the company's commitment and drive geared towards constantly improving products, projects and services offered. Moreover, the company has obtained the OHSAS 18001:2007 (Occupational Health and Safety Assessment Series) certification, which defines the requirements of the workplace safety and health management system.

### Research & DEVELOPMENT

Technological innovation: a crucial factor for competing in the market. In the company's 50-year history, research and change have been the pivotal factors in guaranteeing competitiveness at a global level, thanks to increasingly advanced products in terms of performance and reliability. Each year the company invests an increasing amount of its turnover in research and development, geared towards promoting the constant study and analysis of products, control processes and performance certification. In order to ensure that customers receive products that comply with the requested performance levels, the company carries out simulations on all new products, including NVH (Noise, Vibration, Harshness) tests effected in the advanced semi-anechoic room.

### Customer CARE

Innovative instruments and software applications supporting the technical and logistic requirements of our partners worldwide guarantee a timely and customised service. The experience acquired by Motovario® has led to the creation of the new online portal MyMotovario 4.0, which allows for selecting products and exporting their 3D file. As a result, designers and engineering departments can download the three-dimensional model of the requested product and implement it directly in their own layout. In order to maximise customer service and quality, Motovario® offers all its customers the following online services: Order Tracking, which allows for monitoring the progress of an order in real time, and the Stock Availability service, through which users may check the availability (stock) of our products, both in the Italian plant and in the various branches.

### Motovario chooses technological evolution.

Motovario® has chosen technological evolution and actively collaborates with the Faculty of Engineering of the University of Modena and Reggio Emilia and of the University of Bologna.

**Reliability, sturdiness, versatility**

These are the distinctive traits of Motovario products. A broad range of transmission products that provide a competent, innovative solution to each and every power application need. Cutting-edge tools, unrelenting research efforts and ongoing commitment to upgrading manufacturing equipment to the latest state-of-the-art enable us to offer high quality and performance standards to cater to industry requirements and the broadest variety of applications. Motovario ranks among the leading, well-reputed companies in Italy engaged in the design, manufacture and sales of transmission products for industrial and civil applications. The entire manufacturing process takes place in Formigine and Ubersetto plants, in Modena area, with an overall surface area of over 50,000 sq m. and a workforce of about 500 people, 170 numerically controlled machines and cutting-edge handling, storage and assembly automated systems ensure that all products meet high quality standards. The network includes more than 40 Motovario-certified assembly centres, with the capability to supply products in a broad range of versions, including customised versions, high service capacity and fast response. As a result, our product offering can cater to the needs of all plant engineering sectors, in all industries and for different applications, and includes: speed variators, helical, bevel-helical, parallel helical, worm gear reducers and geared motors, electric motors and inverter motors. All of the products we manufacture share such common features as reliability, sturdiness and versatility, topped with a high innovation content. At the heart of a company's technological innovation is the ability to develop integrated tools for computer-aided calculation simulation and management of different processes as part of product development. When simulating operating, setup and process conditions, it is also necessary to analyse and optimize the overall functional design of a product using a synergistic approach. This is achieved by implementing an exhaustive experimental plan, without using interpolation or approximation, as they frequently allow criticalities or any oversizing which is not conducive to maximising quality/cost ratio to go unnoticed.

**High-efficiency method for calculation according to standards**

A set of specific functions have been developed to this end, a few significant examples include functions to:

- Optimise individual reduction ratios and the combinations of the different reduction stages based on parametrisable target normal series;
- Calculate torque values and maximum permissible external forces for gear reducer units, using iterative numeric algorithms to confirm target life/safety values of components;
- Create databases for loading a finite element structural analysis model by automatically writing all reaction components of bearings under all load conditions to a specific file, with automatic selection of critical cases that need to be verified.

Another goal of the method is to create synergy between calculation according to standards and FEM structural calculation and the implementation of FEM model loading procedures, so as to simplify input data, meshing and constraint criteria.

**Competitiveness and operational benefits of the new method**

This method offers many practical advantages over traditional calculation procedures within the company, namely:

- Iterative optimisation of project since setup stage;
- Accurate assessment of the various service factors and reliability levels for the entire gear reducer unit and for all operating conditions as per catalogue rating or customer specific requirements;
- Faster support to customers in analysing tailored product configurations; Integrated corporate databases that can be updated in real-time.

**Range extension and ongoing evolution**

The steady, significant growth of Motovario Group is achieved thanks to an ongoing search for new calculation and design tools, as well as to customer service. The new tools identified have led to innovation, improved product reliability as well as positive developments in market management. The following software products are used for design, calculation and management:

- Solidworks;
- Kisoft;
- Kissys;
- Ansys;
- FEM modelling analysis software;
- Circuit design and simulation software;
- Specific spreadsheets;
- SAP.

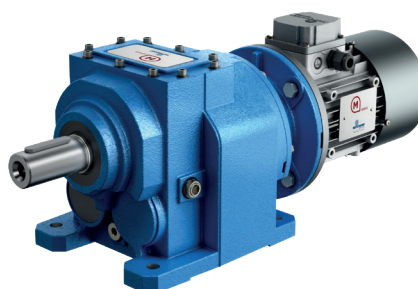
In MyMotovario 4.0 portal, PRODUCT SELECTION includes a section named APPLICATIONS where customers can enter application data and find out which gear reducer suits them best in a matter of minutes.



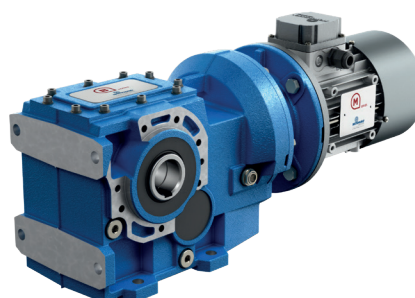
## MOTOVARIO Products

**HELICAL GEAR REDUCERS**

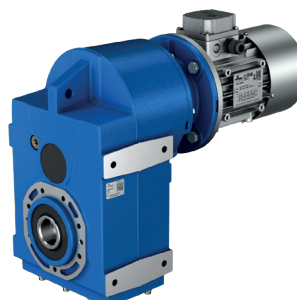
Cast iron or aluminium casing  
 Output shaft up to 90 mm  
 Mn2 up to 8.600 Nm  
 Reduction stages 1, 2, 3  
 Ratios up to 354  
 ATEX units

**HELICAL BEVEL GEAR REDUCERS**

Cast iron or aluminium casing  
 Output shaft up to 110 mm  
 Mn2 up to 14.000 Nm  
 Reduction stages 2, 3  
 Ratios up to 443  
 ATEX units

**SHAFT MOUNTED GEAR REDUCERS**

Cast iron casing  
 Output shaft up to 90 mm  
 Mn2 up to 10.250 Nm  
 Reduction stages 2, 3  
 Ratios up to 395  
 ATEX units

**WORM GEAR REDUCERS**

Cast iron or aluminium casing  
 Output shaft up to 50 mm  
 Mn2 up to 2.700 Nm  
 Ratios up to 1083  
 ATEX units

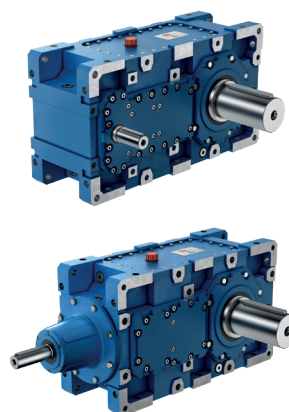
**PLANETARY GEAR REDUCERS**

Cast iron casing  
 Output shaft up to 80 mm  
 Mn2 up to 10000 Nm  
 Reduction stages 1, 2, 3, 4  
 Ratios up to 2700



### PARALLEL HELICAL AND BEVEL HELICAL GEAR REDUCERS FOR MID-HEAVY DUTY INDUSTRY

Cast iron casing  
Output shaft up to 180 mm  
Mn2 up to 110.000 Nm  
Reduction stages 2, 3, 4  
Ratios up to 431  
ATEX units



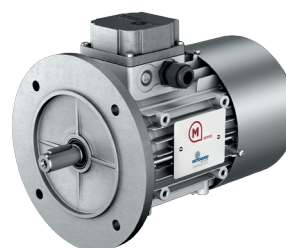
### MOTOVARIATORS AND MOTOVARIATORS-GEAR REDUCERS

Cast iron or aluminium casing  
Mn2 up to 5.000 Nm  
ATEX units



### ELECTRIC MOTORS

Power ratings up to 90 kW  
2, 4, 6 poles  
Three-phase and single-phase, self-braking, double polarity  
Protection grade up to IP66



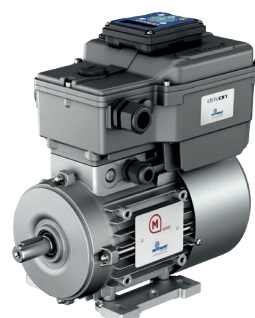
### SELF POWER® SELF-STARTING SYNCHRONOUS ELECTRIC MOTORS

Power ratings up to 7,5 kW  
4 poles  
Three-phase, self-braking  
Protection grade up to IP6



### DRIVES DRIVON – inverter motor

Three-phase and single-phase  
power supply High dynamics  
sensorless vectorial control  
Power ratings up to 5,5 kW  
Standard integrated STO  
Integrated field bus  
Optional field bus



## 1.3 SYMBOLS AND FORMULAS

## 1.3.1 Symbols

| Physical dimensions | Symbol    | Symbol unit of measurement | Input     | Output    |
|---------------------|-----------|----------------------------|-----------|-----------|
| Power               | P         | [kW]                       | $P_1$     | $P_2$     |
| Requested power     | $P_r$     | [kW]                       | $P_{r_1}$ | $P_{r_2}$ |
| Nominal power       | $P_n$     | [kW]                       | $P_{n_1}$ | $P_{n_2}$ |
| Torque              | M         | [Nm]                       | $M_1$     | $M_2$     |
| Nominal torque      | $M_n$     | [Nm]                       |           | $M_{n_2}$ |
| Requested torque    | $M_r$     | [Nm]                       | $M_{r_1}$ | $M_{r_2}$ |
| Speed               | n         | [rpm]                      | $n_1$     | $n_2$     |
| Load                | F         | [N]                        |           |           |
| Radial load         | $F_r$     | [N]                        | $F_{r_1}$ | $F_{r_2}$ |
| Axial load          | $F_a$     | [N]                        | $F_{a_1}$ | $F_{a_2}$ |
| Reduction ratio     | i         |                            |           |           |
| Service factor      | s.f.      |                            |           |           |
| Static              | s         |                            |           |           |
| Dynamic             | d         |                            |           |           |
| Calculated          | c         |                            |           |           |
| Maximum             | max       |                            |           |           |
| Minimum             | min       |                            |           |           |
| Moment of inertia   | J         | [kgm <sup>2</sup> ]        | $J_1$     | $J_2$     |
| Ambient temperature | $T_{amb}$ | [°C]                       |           |           |
| Dimension           |           | [mm]                       |           |           |

## 1.3.2 Formulas

| GEAR REDUCER                                                                                   |                                                    |                  |
|------------------------------------------------------------------------------------------------|----------------------------------------------------|------------------|
| Starting or stopping time                                                                      | $t = v / a$                                        | [s]              |
| Velocity in rotary motion                                                                      | $v = \pi * d * n / 60$<br>$v = \omega * r$         | [m/s]            |
| Speed velocity                                                                                 | $n = 60 * v / (\pi * d)$<br>$\omega = v / r$       | [rpm]<br>[rad/s] |
| Acceleration or deceleration                                                                   | $a = v / t$                                        | [m/s²]           |
| Angular acceleration                                                                           | $\alpha = n / (9,55 * t)$<br>$\alpha = \omega / t$ | [rad/s²]         |
| Starting or stopping distance (according to acceleration or an initial or final speed)         | $s = a * t^2 / 2$<br>$s = v * t / 2$               | [m]              |
| Horizontal translation force                                                                   | $F = \mu * m * g$                                  | [N]              |
| Vertical translation force (lifting)                                                           | $F = m * g$                                        |                  |
| Inclined plane translation force                                                               | $F = m * g (\mu * \cos\beta + \sin\beta)$          |                  |
| m= mass [kg]; g= gravity acceleration [m/s2]; μ= friction coefficient; β= angle of inclination |                                                    |                  |
| Moment of inertia                                                                              | $J = m * v^2 / \omega^2$                           | [kgm²]           |
| Torque                                                                                         | $M = F * d / 2$<br>$M = J * \omega / t$            | [Nm]             |

| MOTOR and GEARED MOTOR                             |                                                           |       |
|----------------------------------------------------|-----------------------------------------------------------|-------|
| Acceleration time                                  | $t_a = (J_{ext} + J_m) * n_n / 9,55 + (M_{spunto} - M_r)$ | [s]   |
| Braking time                                       | $t_s = (J_{ext} + J_m) * n_n / 9,55 + (M_{spunto} + M_r)$ | [s]   |
| Motor rotation angle during starting               | $\phi = n_n * t_a / 19,1$                                 | [rad] |
| Motor rotation angle during braking                | $\phi = n_n * t_s / 19,1$                                 | [rad] |
| Power available at the shaft of single-phase motor | $P = V * I * \eta * \cos\omega$                           | [W]   |
| Power available at the shaft of three-phase motor  | $P = 1,73 * V * I * \eta * \cos\omega$                    | [W]   |

| RUNNING at 60Hz                                                                                                                                                                                                                                                                             |                                                             |       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|
| Speed velocity at 60Hz                                                                                                                                                                                                                                                                      | $n_{60Hz} = 1,2 * n_{50Hz}$                                 | [rpm] |
| Power at 60Hz                                                                                                                                                                                                                                                                               | $P_{1\ 60Hz} = P_{1\ 50Hz} * V_{60Hz} / V_{50Hz}$           | [kW]  |
| If supply voltage at 60 Hz (V60Hz) corresponds to winding voltage at 50 Hz (V50Hz), power doesn't change $P_{1\ 60Hz} = P_{1\ 50Hz}$<br>If supply voltage at 60 Hz (V60Hz) is 20% higher than winding voltage at 50 Hz (V50Hz), power increases by 20% i.e. $P_{1\ 60Hz} = 1,2 P_{1\ 50Hz}$ |                                                             |       |
| Torque at 60Hz                                                                                                                                                                                                                                                                              | $M_{60Hz} = M_{50Hz} * P_{1\ 60Hz} / (1,2 * P_{1\ 50Hz})$   | [Nm]  |
| Service factor at 60Hz                                                                                                                                                                                                                                                                      | $f.s\ 60Hz = f.s\ 50Hz * 1,175 * P_{1\ 50Hz} / P_{1\ 60Hz}$ | -     |

For correctly selecting a gear reducer or geared motor, several essential pieces of data are required:

1. The input speed velocity to the gear reducer ( $n_1$ ) and the output speed velocity ( $n_2$ ). Through these two values it is possible to calculate the reduction ratio ( $i$ ) of the gear reducer using the following formula:  $i = n_1/n_2$
2. The torque required by the application ( $M_{r2}$ )

The geared motor or gear reducer can be selected once this data is known. This guide helps you to select the right product in just a few steps:

#### Geared motor selection

3. Determine the application's actual service factor (**s.f.**). This parameter depends on the type of load of the powered machine, the number of starts per hour and the hours of operation (refer to the "Service factor" paragraph).
4. Calculate the input power  $P_{r1}$  using the required torque value  $M_{r2}$ , the speed  $n_2$  and dynamic efficiency value.  $P_{r1} = (M_{r2} \cdot n_2) / (9550 \cdot \eta_d)$ . The dynamic efficiency value depends on the type of gear reducer and on the number of gear reduction stages. (To calculate the efficiency value see its page).
5. Consult the geared motor performance tables and identify a nominal power value  $P_{n1}$  exceeding the required power  $P_{r1}$ , such that:  $P_{n1} \geq P_{r1}$
6. Once the suitable nominal power has been identified, select the geared motor capable of generating the speed velocity closest to the desired  $n_2$  value and with service factor s.f. greater or equal to that required by the application. In the geared motor selection tables the combinations include 2-pole, 4-pole and 6-pole motors powered at 50Hz.

#### Gear reducer selection:

7. Determine the application's service factor (**s.f.**) (refer to the "Service factor" paragraph).
8. Calculate the reduction ratio ( $i$ ) from the required output speed  $n_2$  and input speed  $n_1$  using the ratio  $i = n_1/n_2$
9. Calculate the torque  $M_{c2}$  to select the gear reducer using the torque required by the application  $M_{r2}$  and the service factor s.f.:  $M_{c2} = M_{r2} \cdot (\text{s.f.})$
10. Consult the Gear Reducer Performance tables looking for the gear reducer that, with the reduction ratio closer to the calculated one, has a nominal torque  $M_{n2}$  so that:  $M_{n2} \geq M_{c2}$

#### Verifications

Once the gear reducer or geared motor has been selected, the following checks should be performed:

##### A. Thermal Power

The gear reducer's thermal power must be equal to or greater than the installed mechanical power, or the power required by the application according to the indications contained in the section (refer to the "Thermal power" paragraph).

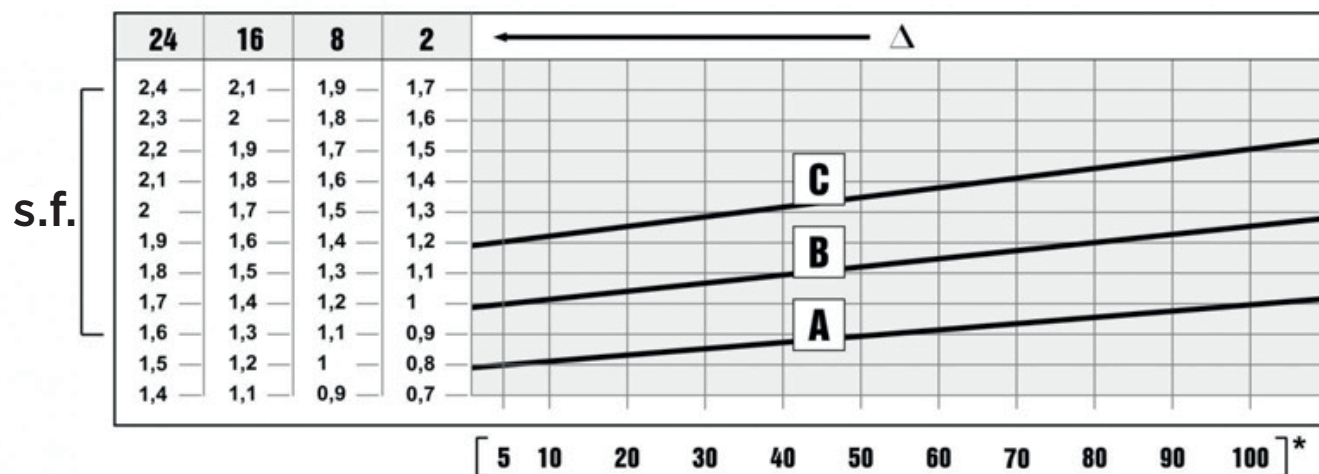
##### B. Maximum Torque

Generally, the maximum torque (peak instantaneous load) that can be applied to the gear reducer must not exceed 200% of the nominal torque  $M_{n2}$  (ATEX - M 2max).

##### C. Radial Loads

1. Verify that the radial loads acting on the input and/or output shafts are within the values indicated in the catalogue. If they exceed these values, increase the size of the gear reducer or modify the external load capacity. During the checking phase, it is important to remember that the values indicated in the catalogue refer to loads acting on the mid-point of the shaft protrusion, therefore, if the load is applied to a different position, appropriate formulas must be used to calculate the admissible load in the desired position (refer to the "Radial loads" paragraph).
2. If accessory output shafts are present, make sure that the applied load is compatible with shaft size. In case of need please contact MOTOVARIO TECHNICAL SERVICE.

D. If an electric motor is going to be fitted to the selected gear reducer, check for its applicability by referring to the configuration table (see paragraph "Available motor mounting flanges"). For motors larger than IEC 180, check whether the motor needs to be supported with feet. In case of need please contact MOTOVARIO TECHNICAL SERVICE.



The service factor (s.f.) depends on the operating conditions the gear reducer is subjected to. The parameters that need to be taken into consideration to select the most adequate service factor correctly comprise:

- type of load of the operated machine: A - B - C length of daily operating time:
- hours/day (Δ) start-up frequency: starts/hour (\*)

#### LOAD:

- A - uniform =  $f_a \leq 0,3$
- B - moderate =  $f_a \leq 3$
- C - heavy =  $f_a \leq 10$

$$f_a = J_e/J_m$$

- $J_e$  [kgm<sup>2</sup>] moment of reduced external inertia at the drive-shaft  $J_m$  [kgm<sup>2</sup>] moment of inertia of motor

If  $f_a > 10$  call MOTOVARIO TECHNICAL SERVICE.

For a motovariator-gear reducer, once the service factor of the application has been determined, it is necessary to compare this value with the S gear reducer safety factor given in the selection tables, checking the condition  $S \geq s.f.$  The maximum number of admissible starts depends on the type of application. Approximately, the figure must not exceed 5-10 per minute. For higher values contact MOTOVARIO TECHNICAL SERVICE.

**A.** Screw feeders for light materials, fans, assembly lines, conveyor belts for light materials, small mixers, lifts, cleaning machines, fillers, control machines.

**B.** Winding devices, woodworking machine feeders, goods lifts, balancers, threading machines, medium mixers, conveyor belts for heavy materials, winches, sliding doors, fertilizer scrapers, packing machines, concrete mixers, crane mechanisms, milling cutters, folding machines, gear pumps.

**C.** Mixers for heavy materials, shears, presses, centrifuges, rotating supports, winches and lifts for heavy materials, grinding lathes, stone mills, bucket elevators, drilling machines, hammer mills, cam presses, folding machines, turntables, tumbling barrels, vibrators, shredders.

### 1.6.1 Installation

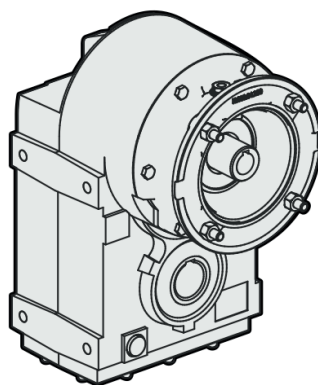
To install the gear reducer it is necessary to note the following recommendations:

- Fixing to the structure of the machine must be stable to prevent any vibrations.
- Check the correct direction of rotation of the gear reducer output shaft before fitting the unit to the machine.
- In the case of particularly lengthy periods of storage (4/6 months), if the oil seal is not immersed in the lubricant inside the unit, it is recommended to change it since the rubber could stick to the shaft or may even have lost the elasticity it needs to function properly.
- Whenever possible, protect the gear reducer against solar radiation and bad weather.
- Ensure the motor cools correctly by ensuring good passage of air from the fan side. In the case of ambient temperatures  $< -5^{\circ}\text{C}$  or  $> +40^{\circ}\text{C}$  call MOTOVARIO TECHNICAL SERVICE.
- The various parts (pulleys, gear wheels, couplings, shafts, etc.) must be mounted on the solid or hollow shafts using special threaded holes or other systems that anyhow ensure correct operation without risking damage to the bearings or external parts of the units.
- Lubricate the surfaces in contact to avoid seizure or oxidation.
- Painting must definitely not go over rubber parts and the holes on the breather plugs, if any.
- For units equipped with oil plugs, replace the closed plug used for shipping with the specific breather plug.
- Check the correct level of the lubricant through the indicator, if there is one.
- Starting must take place gradually, without immediately applying the maximum load. When there are parts, objects or materials under the motor drive that can be damaged by even limited spillage of oil, special protection should be fitted.

#### Assembling motor on PAM flange

When the unit is supplied without motor, to ensure the correct assembly of the electric motor, it is necessary to follow recommendations below. Check that the tolerances for the motor shaft and flange correspond at least to a “normal” quality class. Carefully clean the shaft, spigot and surface of the flange from traces of paint or dirt. Mount the half coupling/sleeve (see figure) onto the electric motor shaft without forcing it, otherwise check the tolerance of the motor key and ensure that it is in the correct position; in any case, use appropriate systems that ensure it is mounted properly without damaging the motor bearings. For the version with half coupling, mount the motor, with half coupling, aligning the tooth drive of the half coupling on motor side with that of the elastic element on the fixed half coupling on the gear reducer side. Motor key adjustment is not provided.

Motor connections sleeve



Motovario products are supplied with the following surface treatment features.

Units with grey cast-iron cases (SN140-SN150) and spheroidal cast iron cases (SN160-SN180):

Die-cast materials are always painted.

Units with grey cast-iron cover (SN140-SN150) and spheroidal cast iron cover (SN160-SN180):

SN... series gear reducers with 2, 3 stages size 140, 150 are supplied with steel cover and a metal nameplate printed.

SN... series gear reducers with 2, 3 stages sizes 160, 180 are supplied with steel cover and a metal nameplate printed.



Paint coating specifications:

- RAL5010 blue textured finish. Product used: Two-component primer and acrylic layer 80 are supplied with steel cover and a metal nameplate printed.

Performance:

- Loading capacity in accordance with DIN 3990, ISO 6336, AGMA 2101, ISO 10300, DIN 3991, ISO 281, DIN 743.

Efficiency  $\eta$ :

The efficiency is the ratio between the output power P2 and the power absorbed by the gear reducer P1:  $\eta = P2/P1$ .

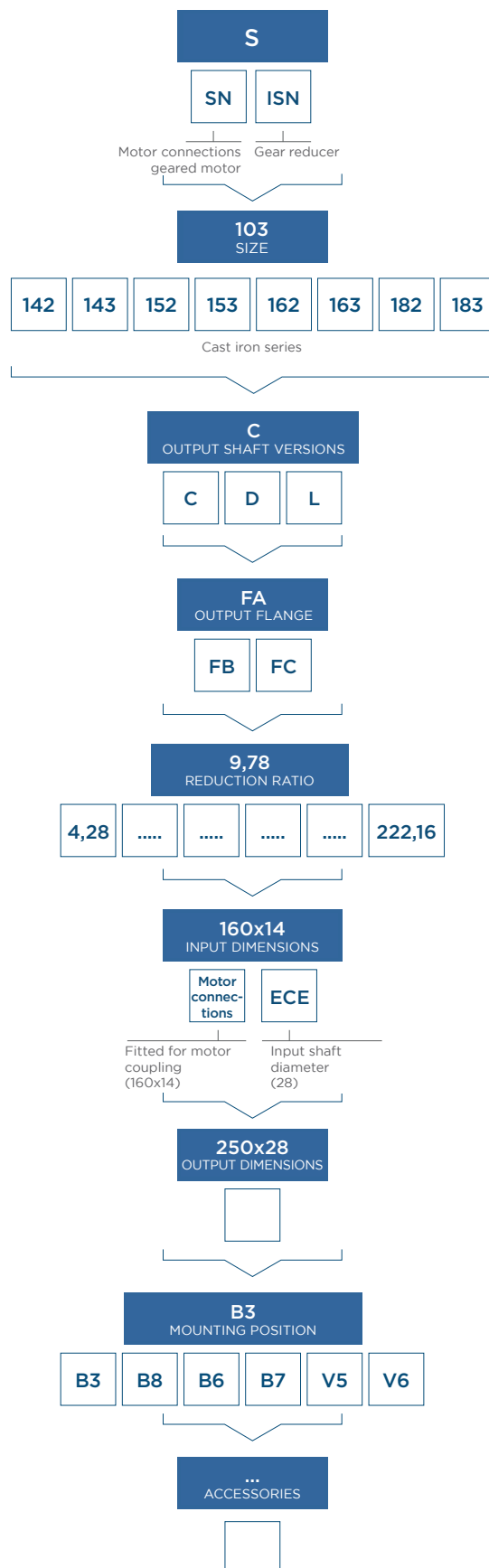
S series shaft-mounted gear reducers have an average value equal to:

SN...2 stages = 0,98

SN...3 stages = 0,96



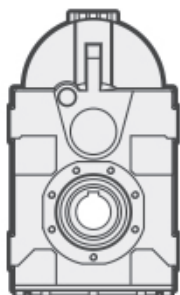
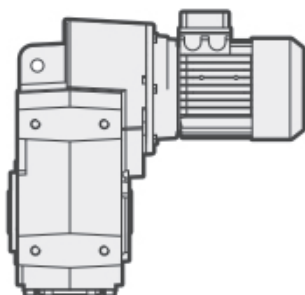
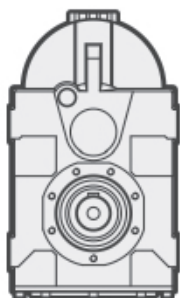
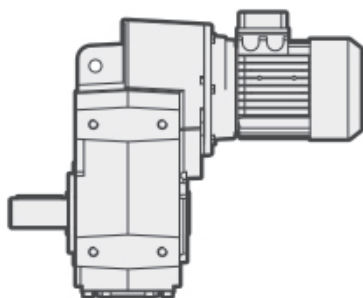
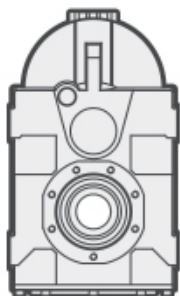
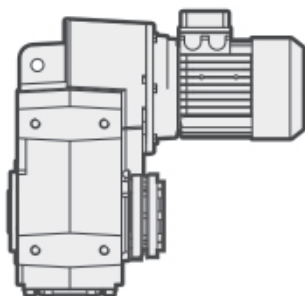
## 2.2.1 Designation



## 2.2 TYPE

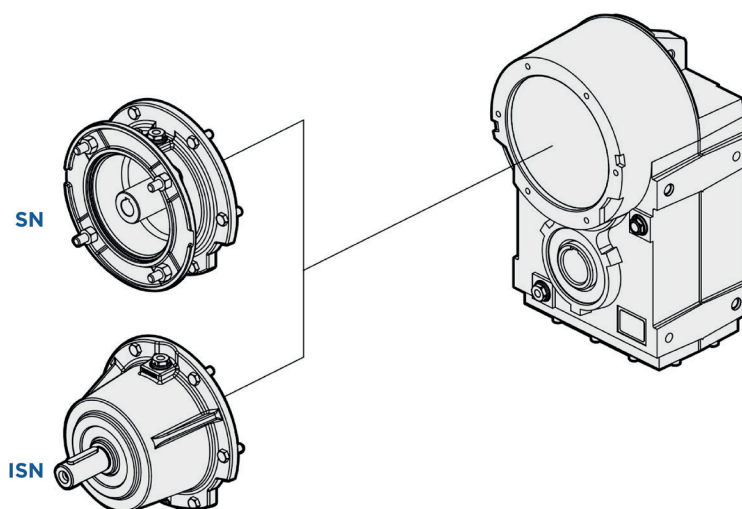
## 2.2.2 Versions

SN...C - SN...D - SN...L

**SN.. C** FOOT-FLANGE / HOLLOW SHAFT FIXING**SN.. D** FOOT-FLANGE / SOLID SHAFT FIXING D**SN.. L** FOOT-FLANGE / SHRINK DISC SHAFT FIXING

## 2.2.3 Modularity

## S SERIES IN GREY AND SPHEROIDAL CAST IRON

**SN**

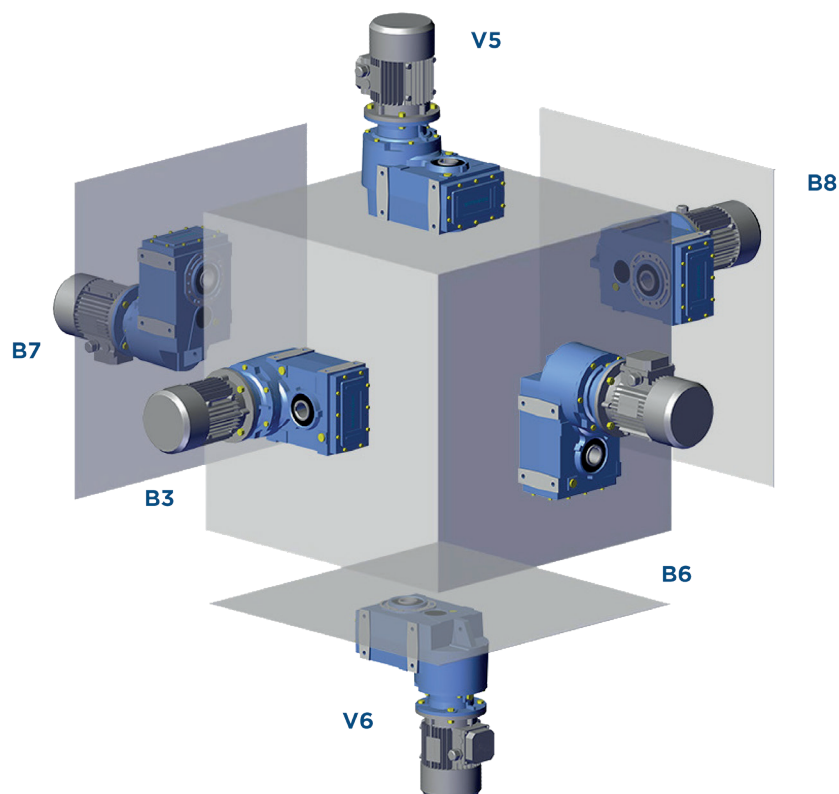
Version with setup for motor coupling (motor connections)

**ISN**

Version with input solid shaft

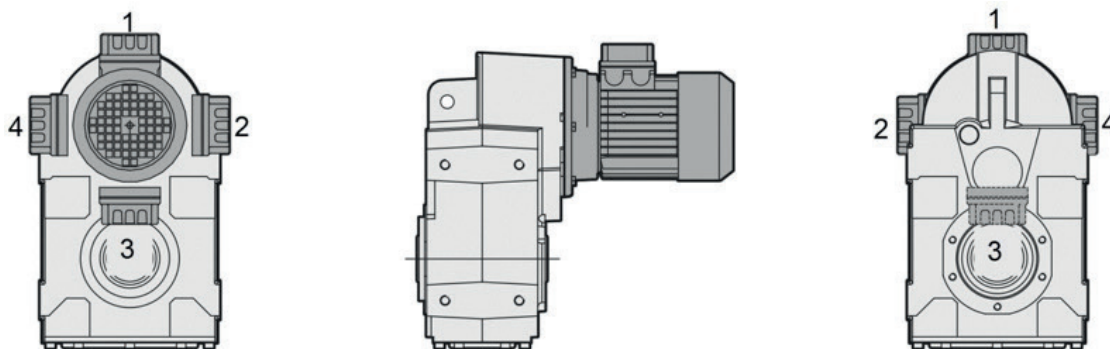
## 2.3.1 Assembly positions

The mounting position of the gear reducer identifies its space orientation. B3 mounting position, as from a technical point of view, ensures lower oil splash, better lubrication and less heating.



## 2.3.2 Position of terminal block

Unless otherwise specified in the order, the unit is supplied with terminal block in position 1.



## 2.5.1 Critical applications

| SN                  | 140 | 150 | 160 | 180 |
|---------------------|-----|-----|-----|-----|
| $1500 < n_1 < 3000$ | B   | B   | B   | B   |

Verified application

A Application not recommended

B Check the application and/or call MOTOVARIO TECHNICAL SERVICE.

(\*) The shrink disc is designed only to transmit the output torque.

In case of mounting position with radial and/or axial loads, please contact MOTOVARIO TECHNICAL SERVICE.

## 2.5.2 Information

The performance given in the catalogue correspond to mounting position B3 or similar, i.e. when the first stage is not entirely immersed in oil. For other mounting positions and/or particular input speeds, refer to the tables that highlight different critical situations for each size of gear reducer. It is also necessary to take due consideration of and carefully assess the following applications by contacting MOTOVARIO TECHNICAL ASSISTANCE:

- Use in services that could be hazardous for people in case of gear reducer failure. Avoid use as multiplier.
- Applications with especially high inertia. Use as a lifting winch.
- Applications with high dynamic strain on the case of the gear reducer. In places with Tamb under -5°C or over 40°C. Use in chemically-aggressive environments.
- Use in a brackish environments.
- Mounting positions not envisaged in the catalogue. Use in radioactive environments.
- Use in environments with pressures other than atmospheric pressure.
- For  $i < 20$  in V5, use of an expansion tank.

Avoid applications where even partial immersion of the gear reducer is required.

In the presence of overloading due to full load, braking, shocks or other static and dynamic causes, please verify that the peak torque is less than  $2 \cdot M_{n2}$ .

## 2.6 AVAILABLE MOTOR MOUNTING FLANGES

The tables show available coupling configurations and the matching motors. Check the service factor.

| SN142 |     |     |     |     |
|-------|-----|-----|-----|-----|
| i     | 132 | 160 | 180 | 200 |
| 4,28  |     |     | B5  | B5  |
| 4,92  |     |     | B5  | B5  |
| 5,68  |     |     | B5  | B5  |
| 5,89  |     |     | B5  | B5  |
| 6,61  |     |     | B5  | B5  |
| 7,45  |     |     | B5  | B5  |
| 7,75  |     |     | B5  | B5  |
| 8,91  |     |     | B5  | B5  |
| 10,29 |     | B5  | B5  | B5  |
| 10,67 |     | B5  | B5  | B5  |
| 11,96 |     | B5  | B5  | B5  |
| 13,48 |     | B5  | B5  | B5  |
| 15,30 |     | B5  | B5  | B5  |
| 17,49 |     | B5  | B5  | B5  |
| 20,20 |     | B5  | B5  | B5  |
| 23,36 | B5  | B5  | B5  |     |
| 26,11 | B5  | B5  | B5  |     |

| SN143  |     |     |     |     |     |
|--------|-----|-----|-----|-----|-----|
| i      | 100 | 112 | 132 | 160 | 180 |
| 30,04  |     |     |     | B5  | B5  |
| 34,02  |     |     | B5  | B5  | B5  |
| 38,70  |     |     | B5  | B5  | B5  |
| 44,27  |     |     | B5  | B5  | B5  |
| 51,01  |     |     | B5  | B5  |     |
| 59,34  |     |     | B5  | B5  |     |
| 60,82  |     |     | B5  | B5  |     |
| 69,18  |     |     | B5  | B5  |     |
| 79,14  |     |     | B5  |     |     |
| 91,19  |     |     | B5  |     |     |
| 106,08 |     |     | B5  |     |     |
| 124,53 | B5  | B5  | B5  |     |     |
| 139,76 | B5  | B5  | B5  |     |     |
| 167,96 | B5  | B5  | B5  |     |     |
| 197,01 | B5  | B5  |     |     |     |
| 221,47 | B5  | B5  |     |     |     |

| SN152 |     |     |     |
|-------|-----|-----|-----|
| i     | 180 | 200 | 225 |
| 4,47  |     | B5  | B5  |
| 5,06  |     | B5  | B5  |
| 5,75  |     | B5  | B5  |
| 6,58  |     | B5  | B5  |
| 6,97  |     | B5  | B5  |
| 7,76  |     | B5  | B5  |
| 8,70  |     | B5  | B5  |
| 9,00  |     | B5  | B5  |
| 10,23 |     | B5  | B5  |
| 11,71 |     | B5  | B5  |
| 12,40 |     | B5  | B5  |
| 13,81 | B5  | B5  | B5  |
| 15,46 | B5  | B5  | B5  |
| 17,44 | B5  | B5  |     |
| 19,82 | B5  | B5  |     |
| 22,77 | B5  | B5  |     |

| SN153  |     |     |     |     |     |     |     |
|--------|-----|-----|-----|-----|-----|-----|-----|
| i      | 100 | 112 | 132 | 160 | 180 | 200 | 225 |
| 17,95  |     |     |     |     |     |     | B5  |
| 18,61  |     |     |     |     |     |     | B5  |
| 20,87  |     |     |     |     |     |     | B5  |
| 24,06  |     |     |     | B5  | B5  | B5  | B5  |
| 27,65  |     |     |     | B5  | B5  | B5  | B5  |
| 31,92  |     |     |     | B5  | B5  | B5  | B5  |
| 33,10  |     |     |     | B5  | B5  | B5  | B5  |
| 37,12  |     |     |     | B5  | B5  | B5  |     |
| 41,85  |     |     |     | B5  | B5  | B5  |     |
| 46,99  |     |     |     | B5  | B5  |     |     |
| 53,99  |     |     |     | B5  | B5  |     |     |
| 62,33  |     |     |     | B5  | B5  |     |     |
| 64,64  |     |     |     | B5  | B5  |     |     |
| 72,50  |     |     | B5  | B5  | B5  |     |     |
| 81,72  |     |     | B5  | B5  | B5  |     |     |
| 92,70  |     |     | B5  | B5  |     |     |     |
| 105,99 |     |     | B5  | B5  |     |     |     |
| 122,41 |     |     | B5  | B5  |     |     |     |
| 141,55 | B5  | B5  | B5  | B5  |     |     |     |
| 158,23 | B5  | B5  | B5  |     |     |     |     |
| 190,20 | B5  | B5  | B5  |     |     |     |     |
| 222,16 | B5  | B5  | B5  |     |     |     |     |

## 2.6 AVAILABLE MOTOR MOUNTING FLANGES

| SN162 |     |     |     |
|-------|-----|-----|-----|
| i     | 225 | 250 | 280 |
| 5,66  | B5  | B5  | B5  |
| 6,35  | B5  | B5  | B5  |
| 7,16  | B5  | B5  | B5  |
| 8,12  | B5  | B5  | B5  |
| 8,75  | B5  | B5  | B5  |
| 9,78  | B5  | B5  | B5  |
| 10,97 | B5  | B5  | B5  |
| 12,36 | B5  | B5  | B5  |
| 14,02 | B5  | B5  | B5  |

| SN163  |     |     |     |     |     |     |     |
|--------|-----|-----|-----|-----|-----|-----|-----|
| i      | 132 | 160 | 180 | 200 | 225 | 250 | 280 |
| 13,58  |     |     |     | B5  | B5  | B5  | B5  |
| 15,45  |     |     |     | B5  | B5  | B5  | B5  |
| 17,67  |     |     |     | B5  | B5  | B5  | B5  |
| 23,44  |     |     | B5  | B5  | B5  | B5  | B5  |
| 26,66  |     |     | B5  | B5  | B5  | B5  | B5  |
| 30,50  |     |     | B5  | B5  | B5  | B5  |     |
| 35,24  |     | B5  | B5  | B5  | B5  | B5  |     |
| 39,92  |     | B5  | B5  | B5  | B5  |     |     |
| 45,41  |     | B5  | B5  | B5  | B5  |     |     |
| 51,94  |     | B5  | B5  | B5  | B5  |     |     |
| 55,01  |     | B5  | B5  | B5  | B5  |     |     |
| 61,27  |     | B5  | B5  | B5  |     |     |     |
| 68,62  |     | B5  | B5  | B5  |     |     |     |
| 77,36  | B5  | B5  | B5  |     |     |     |     |
| 87,95  | B5  | B5  | B5  |     |     |     |     |
| 101,03 | B5  | B5  | B5  |     |     |     |     |
| 115,03 | B5  | B5  | B5  |     |     |     |     |
| 128,20 | B5  | B5  | B5  |     |     |     |     |

| SN182 |     |     |     |     |
|-------|-----|-----|-----|-----|
| i     | 225 | 250 | 280 | 315 |
| 7,08  |     |     | B5  | B5  |
| 7,88  |     |     | B5  | B5  |
| 8,82  |     |     | B5  | B5  |
| 9,94  |     |     | B5  | B5  |
| 11,85 |     | B5  | B5  | B5  |
| 13,19 |     | B5  | B5  | B5  |
| 14,77 |     | B5  | B5  | B5  |
| 16,64 | B5  | B5  | B5  | B5  |
| 14,02 | B5  | B5  | B5  |     |

| SN183  |     |     |     |     |     |     |     |
|--------|-----|-----|-----|-----|-----|-----|-----|
| i      | 160 | 180 | 200 | 225 | 250 | 280 | 315 |
| 20,27  |     |     |     | B5  | B5  | B5  | B5  |
| 22,85  |     |     |     | B5  | B5  | B5  | B5  |
| 25,92  |     |     | B5  | B5  | B5  | B5  | B5  |
| 33,93  |     | B5  | B5  | B5  | B5  | B5  |     |
| 38,24  |     | B5  | B5  | B5  | B5  | B5  |     |
| 43,38  |     | B5  | B5  | B5  | B5  |     |     |
| 50,12  |     | B5  | B5  | B5  | B5  |     |     |
| 56,21  | B5  | B5  | B5  | B5  |     |     |     |
| 63,36  | B5  | B5  | B5  | B5  |     |     |     |
| 71,87  | B5  | B5  | B5  | B5  |     |     |     |
| 84,31  | B5  | B5  | B5  |     |     |     |     |
| 93,91  | B5  | B5  | B5  |     |     |     |     |
| 105,33 | B5  | B5  |     |     |     |     |     |
| 119,15 | B5  | B5  |     |     |     |     |     |
| 136,23 | B5  | B5  |     |     |     |     |     |
| 153,87 | B5  | B5  |     |     |     |     |     |
| 171,00 | B5  | B5  |     |     |     |     |     |
| 191,74 | B5  |     |     |     |     |     |     |

## 2.7 OUTPUT SHAFT BEARINGS

| SN      | 142/143  | 152/153  | 162/163  | 182/183  |
|---------|----------|----------|----------|----------|
| Version | Standard | Standard | Standard | Standard |
| C       | 2        | 2        | 2        | 2        |
| D       | 2        | 2        | 2        | 2        |
| L       | 2        | 2        | 2        | 2        |

1 - Ball Bearings

2 - Conical roller bearings

/ - Not Available



### 2.8.1 Information

The value of the admissible radial load [N] is given in the tables relating to the performance of the gear reducer at issue. It is related to the load applied on the centre line of the shaft and in the most unfavourable conditions of angle of application and direction of rotation. The maximum admissible axial loads are 1/5 of the value of the given radial load when they are applied in combination with the radial load. The tables relating to the output shafts give the admissible maximum value. This value must never be exceeded since it relates to the strength of the case. Particular conditions of radial load higher than the limits of the catalogue may occur. In this case, call our Technical Service and provide details on the application: direction of the load, direction of rotation of the shaft, type of service. In case of double extension shafts with radial load applied on both ends, the max. admissible radial loads must be defined according to the specific running conditions, in this case call our Technical Service. The radial load on the shaft is calculated with the following formula:  $Fr_e = (2000 \cdot M \cdot f_z) / D \leq Fr_1$  or  $Fr_2$

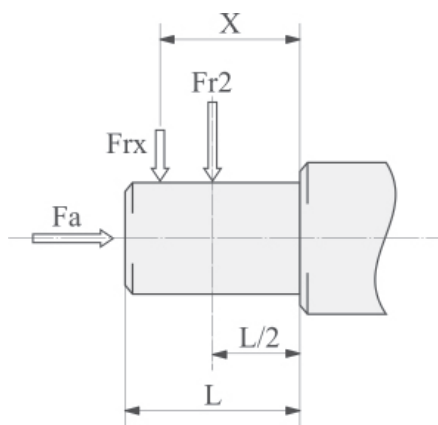
- $Fr_e$  (N) Resultant radial load
- $M$  [Nm] Torque on the shaft
- $D$  [mm] Diameter of the transmission member mounted on the shaft
- $Fr_1$ - $Fr_2$  [N] Maximum admissible radial loading (see relevant tables)
- $f_z = 1,1$  gear pinion - 1,4 chain wheel - 1,7 v-pulley - 2,5 flat pulley

### 2.8.2 Input

When the resultant radial load is not on the centre line of the shaft, it is necessary to adjust the admissible radial load  $Fr_1$  with the following formula:

$$Fr_x = (Fr_1 \cdot a) / (b + x)$$

- $a, b$  = values given in the tables
- $x$  = distance from the point of application of the load to the shaft



| ISN         | 142/143 | 152/153 | 162/163 | 182/183 |
|-------------|---------|---------|---------|---------|
| a           | 215,5   | 179,5   | 220,5   | 261,5   |
| b           | 160,5   | 129,5   | 165,5   | 206,5   |
| Fr1 max(**) | 3515    | 3590    | 5218    | 26012   |

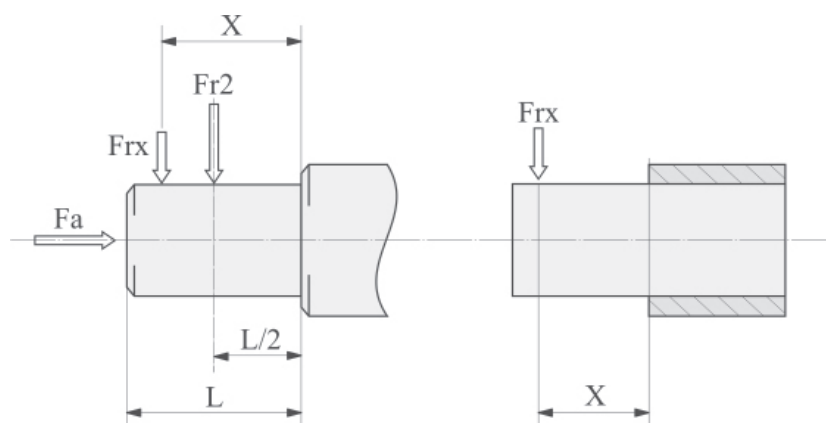
(\*\*Fr1) Admissible maximum value for gear reducer under static conditions and/or for short periods of duty. For continuous-duty radial loading, please verify the values given in the performance tables calculated according to casing, shaft and bearings.

## 2.8.3 Output

When the resultant radial load is not on the centre line of the shaft, it is necessary to adjust the admissible radial load  $Fr_2$  with the following formula:

$$Fr_x = (Fr_2 \cdot a) / (b + x)$$

- $a, b$  = values given in the tables
- $x$  = distance from the point of application of the load to the shaft



| SN                     | 142/143 | 152/153 | 162/163 | 182/183 |
|------------------------|---------|---------|---------|---------|
| a                      | 344     | 407,5   | 485     | 556     |
| b                      | 274     | 322,5   | 380     | 451     |
| $Fr_2 \text{ max(**)}$ | 38694   | 55500   | 76000   | 100000  |

(\*\* $Fr_2$ ) Admissible maximum value for gear reducer under static conditions and/or for short periods of duty. For continuous-duty radial loading, please verify the values given in the performance tables calculated according to casing, shaft and bearings.

## 2.9.1 Information

In cases of ambient temperatures not envisaged in the table, call our Technical Service. In the case of temperatures under  $-30^{\circ}\text{C}$  or over  $60^{\circ}\text{C}$  it is necessary to use oil seals with special compound. For operating ranges with temperatures under  $0^{\circ}\text{C}$  it is necessary to consider the following:

1. The motors need to be suitable for operation at the envisaged ambient temperature.
2. The power of the electric motor needs to be adequate for exceeding the higher starting torques required.
3. In case of cast-iron gear reducers, pay attention to impact loads since cast iron may have problems of fragility at temperatures under  $-15^{\circ}\text{C}$ .
4. During the early stages of service, problems of lubrication may arise due to the high level of viscosity taken on by the oil and so it is wise to have a few minutes of rotation under no load.

Oil (NON ATEX products) must be changed after approx. 10000 hours/2 years of operation; this time varies based on the type of service and on the environment inside which the gear reducer is installed. For units supplied without oil plugs, lubrication is permanent and so they need no servicing.

## 2.9.2 Lubricants

Specifications of lubricants recommended by Motovario.  
The units SN142/3 - 182/3 are supplied without lubricant.

|                             | SN142/3 - 182/3           |                            |
|-----------------------------|---------------------------|----------------------------|
|                             | Mineral oil               |                            |
| Tamb $^{\circ}\text{C}$ ISO | (-5) - (+40)<br>ISO VG220 | (-15) - (+25)<br>ISO VG150 |
| LAND OIL                    | GEAR POWER 220            | -                          |
| ENI                         | BLASIA 220                | BLASIA 150                 |
| SHELL                       | OMALA S2 G 220            | OMALA S2<br>G 150          |
| KLUBER                      | Kluberoil GEM 1-220N      | Kluberoil GEM<br>1-150N    |
| MOBIL                       | MOBILGEAR 600 XP220       | MOBILGEAR 600 XP150        |
| CASTROL                     | ALPHA SP 220              | ALPHA SP 150               |
| BP                          | ENERGOL<br>GR-XP220       | ENERGOL GR-XP150           |
| PETRONAS                    | GEAR MEP 220              | GEAR MEP 150               |

## 2.9.3 Special lubricants

|        | Tamb C       | Polyglycol synthetic oil         |
|--------|--------------|----------------------------------|
| ENI    | (-30)- (+30) | Blasia S 150 (ISO VG150)         |
|        | (-20)- (+40) | Blasia S 220 (ISO VG220)         |
| MOBIL  | (-45)- (+0)  | SHC 624 (ISO VG32)               |
|        | (-40)- (+5)  | SHC 626 (ISO VG68)               |
| KLUBER | (-40)- (+5)  | Klubersynth GH 6-32 (ISO VG32)   |
|        | (-35)- (+10) | Klubersynth GH 6-80 (ISO VG80)   |
|        | (-30)- (+40) | Klubersynth GH 6-150 (ISO VG150) |
|        | (-25)- (+40) | Klubersynth GH 6-220 (ISO VG220) |
|        | (-15)- (+50) | Klubersynth GH 6-460 (ISO VG460) |
|        | (-10)- (+70) | Klubersynth GH 6-680 (ISO VG680) |

|        | Tamb C       | Polyglycol synthetic oil for food grade |
|--------|--------------|-----------------------------------------|
| KLUBER | (-30)- (+15) | Klubersynth UH1-6 100 (ISO VG100)       |
|        | (-25)- (+40) | Klubersynth UH1-6 220 (ISO VG220)       |
|        | (-15)- (+40) | Klubersynth UH1-6 320 (ISO VG320)       |
|        | (-15)- (+50) | Klubersynth UH1-6 460 (ISO VG460)       |
|        | (-10)- (+50) | Klubersynth UH1-6 680 (ISO VG680)       |

If 'special' lubricant is required please contact MOTOVARIO TECHNICAL SERVICE.

## 2.9.4 Quantity

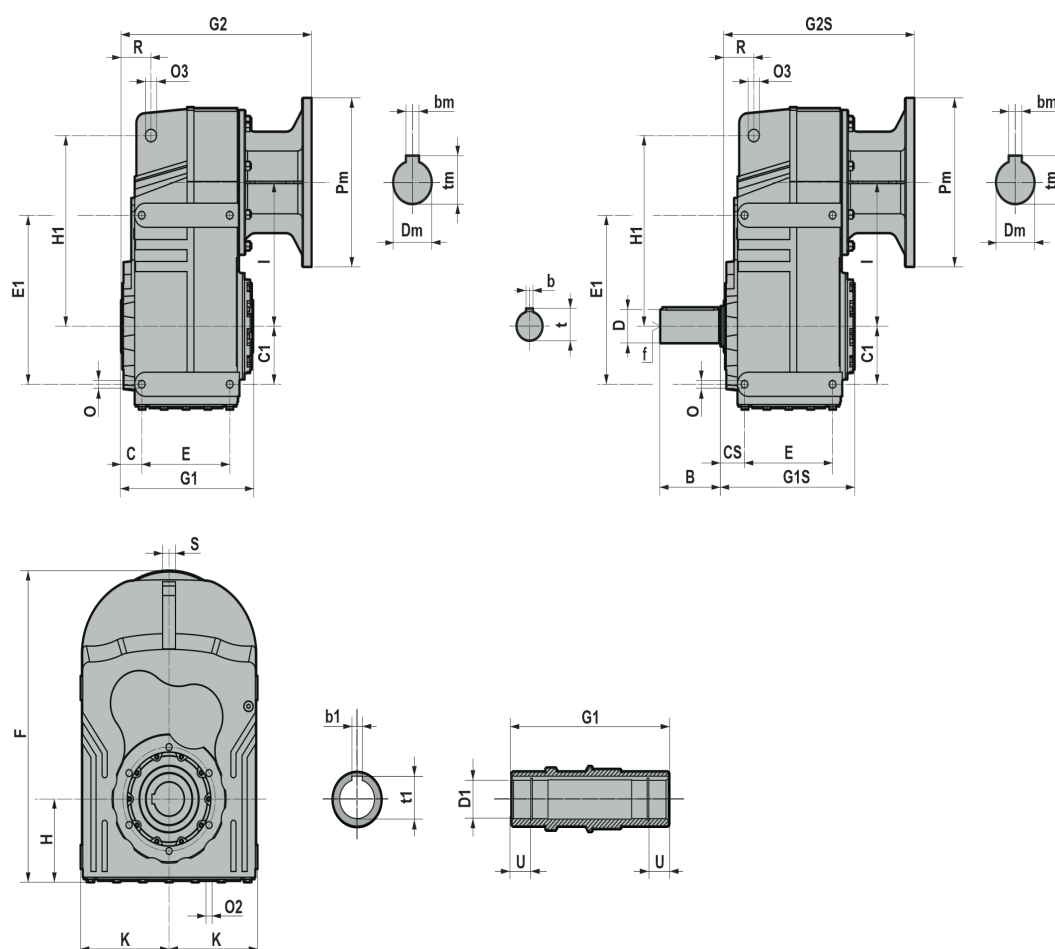
- For all SN... series gear reducers with 2, 3 stages it is always necessary to specify the envisaged mounting position.
- SN... series gear reducers with 2, 3 stages sizes 140, 150, 160, 180 have no lubricant and are fitted with oil plugs to suit any mounting position included in the catalogue. The oil filling can be done on request, in this case it is recommended, after installation, to replace the closed plug used for transportation with the supplied breather plug. When the gear reducer is supplied without lubricant, it is provided with a label to be filled in.

Oil quantity in the table (litres ~) is indicative; for a proper use you will have to refer to the level plug or the dipstick. Any level difference could depend on construction tolerances, but also on the mounting position of the unit or on the mounting surface at the customer's premises. For this reason it is appropriate that the customer checks and, if necessary, restores the level when the unit are installed.

| SN | 142  | 143  | 152  | 153  | 162 | 163  | 182  | 183 |
|----|------|------|------|------|-----|------|------|-----|
| B3 | 22,8 | 21,5 | 35   | 33   | 55  | 50   | 97   | 93  |
| B8 | 22,5 | 21   | 34,5 | 32,5 | 54  | 49   | 95   | 89  |
| B6 | 22   | 21   | 34   | 32   | 53  | 48,5 | 87   | 84  |
| B7 | 16   | 14   | 26   | 21   | 43  | 39   | 80,5 | 77  |
| V5 | 27   | 26,5 | 44   | 40   | 67  | 61   | 117  | 112 |
| V6 | 27   | 25,2 | 37   | 35   | 58  | 53   | 113  | 110 |

For i<20 in V5, use of an expansion tank.

## 3.1.1 SN 142...183



|             | C    | CS   | C1  | E   | E1  | F    | G1  | G1S | H   | H1  | I   | K   | O   | O2  | O3 | S   | S  |
|-------------|------|------|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|----|
| SN142/SN143 | 48,5 | 56,5 | 120 | 205 | 350 | 630  | 308 | 316 | 176 | 395 | 298 | 206 | M16 | M16 | 26 | 70  | 30 |
| SN152/SN153 | 70   | 79,5 | 125 | 235 | 400 | 727  | 363 | 373 | 202 | 485 | 343 | 232 | M24 | M20 | 26 | 88  | 36 |
| SN162/SN163 | 79   | 89   | 142 | 280 | 450 | 863  | 428 | 438 | 233 | 550 | 400 | 265 | M24 | M24 | 33 | 110 | 40 |
| SN182/SN183 | 118  | 130  | 170 | 310 | 540 | 1049 | 500 | 512 | 271 | 660 | 455 | 330 | M30 | M30 | 33 | 150 | 45 |

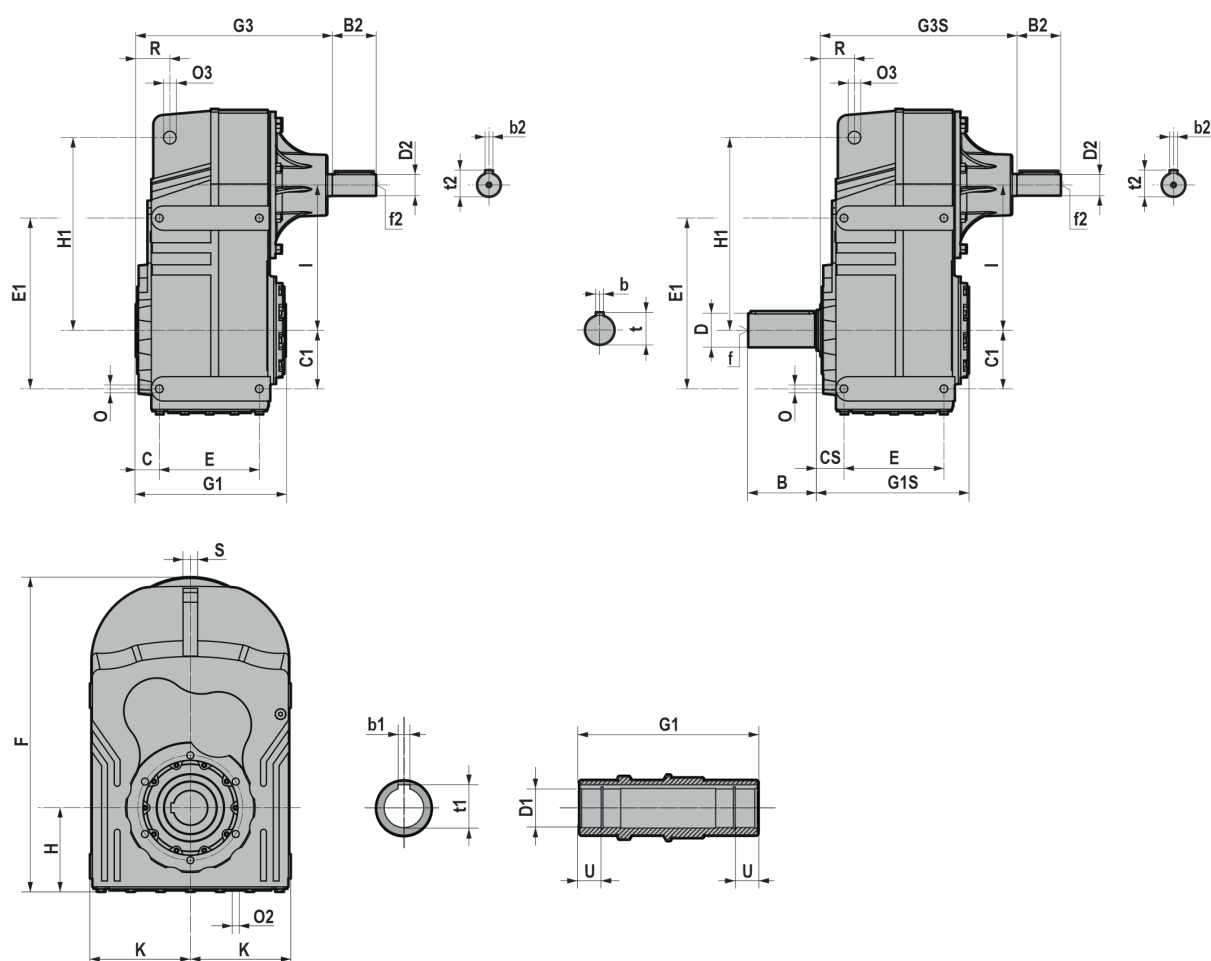
|             | D1                     | b1 | t1    | U  | B   | D                          | b  | t    | f   |
|-------------|------------------------|----|-------|----|-----|----------------------------|----|------|-----|
| SN142/SN143 | 70 <sup>+0,03/0</sup>  | 20 | 70    | 38 | 140 | 70 <sup>+0,03/+0,01</sup>  | 20 | 74,5 | M20 |
| SN152/SN153 | 90 <sup>+0,04/0</sup>  | 25 | 95,4  | 50 | 170 | 90 <sup>+0,04/+0,01</sup>  | 25 | 95   | M24 |
| SN162/SN163 | 110 <sup>+0,04/0</sup> | 28 | 116,4 | 55 | 210 | 110 <sup>+0,04/+0,01</sup> | 28 | 116  | M24 |
| SN182/SN183 | 120 <sup>+0,04/0</sup> | 32 | 127,4 | 40 | 210 | 120 <sup>+0,04/+0,01</sup> | 32 | 127  | M24 |

## 3.1 GEAR REDUCERS/GEARED MOTORS

| IEC     | Pm x Dm | SN142/SN143 |     | SN152/SN153 |     | SN162/SN163 |     | SN182/SN183 |     |
|---------|---------|-------------|-----|-------------|-----|-------------|-----|-------------|-----|
|         |         | G2          | G2S | G2          | G2S | G2          | G2S | G2          | G2S |
| 100-112 | 250x28  | 348         | 356 | 390         | 400 | /           | /   | /           | /   |
| 132     | 300x38  | 369         | 377 | 405         | 415 | 457         | 467 | /           | /   |
| 160     | 350x42  | 444         | 452 | 480         | 490 | 602         | 612 | 591         | 603 |
| 180     | 350x48  | 444         | 452 | 480         | 490 | 602         | 612 | 591         | 603 |
| 200     | 400x55  | 464         | 472 | 500         | 510 | 602         | 612 | 615         | 627 |
| 225     | 450x60  | /           | /   | 533         | 563 | 602         | 612 | 657         | 669 |
| 250     | 550x65  | /           | /   | /           | /   | 602         | 612 | 709         | 721 |
| 280     | 550x75  | /           | /   | /           | /   | 602         | 612 | 709         | 721 |
| 315     | 660x80  | /           | /   | /           | /   | /           | /   | 759         | 771 |

| B5  | Pm  | Dm | bm | tm   |
|-----|-----|----|----|------|
| 100 | 250 | 28 | 8  | 31,3 |
| 112 | 250 | 28 | 8  | 31,3 |
| 132 | 300 | 38 | 10 | 41,3 |
| 160 | 350 | 42 | 12 | 45,3 |
| 180 | 350 | 48 | 14 | 51,8 |
| 200 | 400 | 55 | 16 | 59,3 |
| 225 | 450 | 60 | 18 | 64,4 |
| 250 | 550 | 65 | 18 | 69,4 |
| 280 | 550 | 75 | 20 | 79,9 |
| 315 | 660 | 80 | 22 | 85   |

## 3.1.2 ISN 142...183



|               | C    | CS   | C1  | E   | E1  | F    | G1  | G1S | H   | H1  | I   | K   | O   | O2  | O3 | S   | S  |
|---------------|------|------|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|----|
| ISN142/ISN143 | 48,5 | 56,5 | 120 | 205 | 350 | 630  | 308 | 316 | 176 | 395 | 298 | 206 | M16 | M16 | 26 | 70  | 30 |
| ISN152/ISN153 | 70   | 79,5 | 125 | 235 | 400 | 727  | 363 | 373 | 202 | 485 | 343 | 232 | M24 | M20 | 26 | 88  | 36 |
| ISN162/ISN163 | 79   | 89   | 142 | 280 | 450 | 863  | 428 | 438 | 233 | 550 | 400 | 265 | M24 | M24 | 33 | 110 | 40 |
| ISN182/ISN183 | 118  | 130  | 170 | 310 | 540 | 1049 | 500 | 512 | 271 | 660 | 455 | 330 | M30 | M30 | 33 | 150 | 45 |

|               | D1                     | b1 | t1    | U  | B   | D                          | b  | t    | f   |
|---------------|------------------------|----|-------|----|-----|----------------------------|----|------|-----|
| ISN142/ISN143 | 70 <sup>+0,03/0</sup>  | 20 | 70    | 38 | 140 | 70 <sup>+0,03/+0,01</sup>  | 20 | 74,5 | M20 |
| ISN152/ISN153 | 90 <sup>+0,04/0</sup>  | 25 | 95,4  | 50 | 170 | 90 <sup>+0,04/+0,01</sup>  | 25 | 95   | M24 |
| ISN162/ISN163 | 110 <sup>+0,04/0</sup> | 28 | 116,4 | 55 | 210 | 110 <sup>+0,04/+0,01</sup> | 28 | 116  | M24 |
| ISN182/ISN183 | 120 <sup>+0,04/0</sup> | 32 | 127,4 | 40 | 210 | 120 <sup>+0,04/+0,01</sup> | 32 | 127  | M24 |

|               | G3  | G3S | B2                        | D2  | b2 | t2   | f2  |
|---------------|-----|-----|---------------------------|-----|----|------|-----|
| ISN142/ISN143 | 404 | 411 | 44 <sup>+0,02/0</sup>     | 90  | 12 | 47   | M16 |
| ISN152/ISN153 | 468 | 478 | 48 <sup>+0,02/0</sup>     | 100 | 14 | 51,5 | M16 |
| ISN162/ISN163 | 561 | 571 | 55 <sup>+0,03/+0,01</sup> | 120 | 16 | 59   | M20 |
| ISN182/ISN183 | 646 | 658 | 55 <sup>+0,03/+0,01</sup> | 120 | 16 | 59   | M20 |

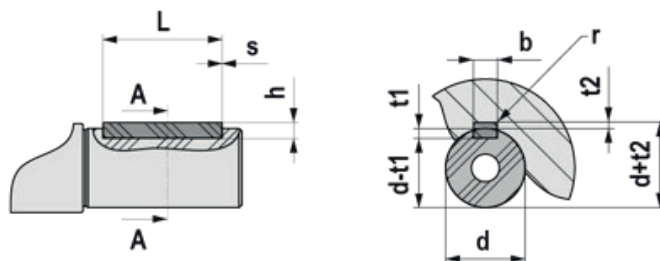


The table shows the approximate weights of the gear reducers.

\*Weight without motor.

| ISN | ~ kg |
|-----|------|
| 142 | 201  |
| 143 | 204  |
| 152 | 275  |
| 153 | 276  |
| 162 | 390  |
| 163 | 394  |
| 182 | 570  |
| 183 | 575  |

## 3.3 SHAFT END

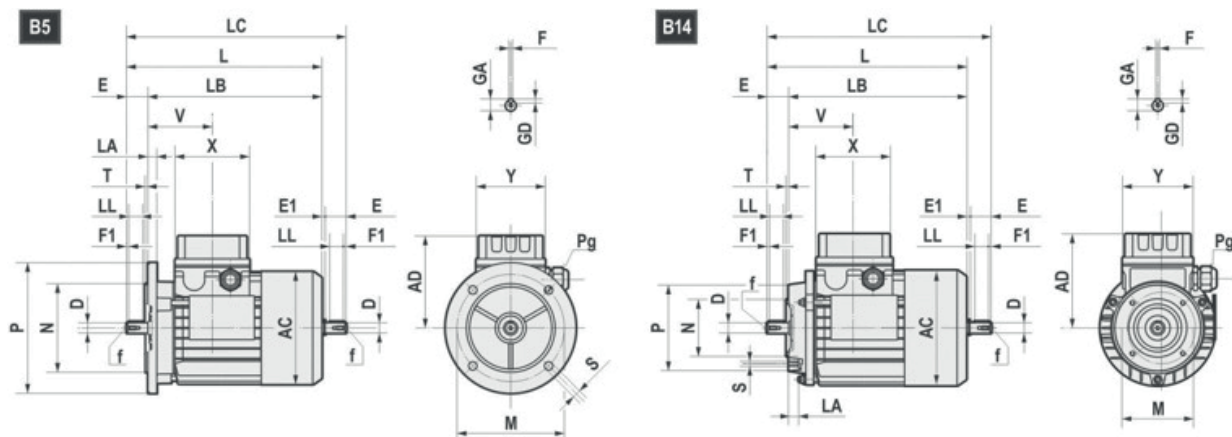


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| d |     |     | b x h |   |    | Tol. b<br>/ h | L   |     | s<br>min /<br>max | b  | t1  | t2   | Tol. t1 /<br>t2 | r max        |
|---|-----|-----|-------|---|----|---------------|-----|-----|-------------------|----|-----|------|-----------------|--------------|
|   | 6   | 8   | 2     | × | 2  | h9 / h9       | 6   | 20  | 0,16<br>0,25      | 2  | 1,2 | 1    | 0,1<br>0        | 0,08<br>0,16 |
|   | 8   | 10  | 3     | × | 3  |               | 6   | 36  |                   | 3  | 1,8 | 1,4  |                 |              |
|   | 10  | 12  | 4     | × | 4  |               | 8   | 45  |                   | 4  | 2,5 | 1,8  |                 |              |
|   | 12  | 17  | 5     | × | 5  |               | 10  | 56  | 0,25<br>0,4       | 5  | 3   | 2,3  |                 | 0,16<br>0,25 |
|   | 17  | 22  | 6     | × | 6  |               | 14  | 70  |                   | 6  | 3   | 2,8  |                 |              |
|   | 22  | 30  | 8     | × | 7  | h9 / h11      | 18  | 90  | 0,4<br>0,6        | 8  | 4   | 3,3  | 0,2<br>0        | 0,16<br>0,25 |
|   | 30  | 38  | 10    | × | 8  |               | 22  | 110 |                   | 10 | 5   | 3,3  |                 |              |
| > | 38  | 44  | 12    | × | 8  |               | 28  | 140 |                   | 12 | 5   | 3,3  |                 |              |
| > | 44  | 50  | 14    | × | 9  |               | 36  | 160 |                   | 14 | 5,5 | 3,8  |                 |              |
| > | 50  | 58  | 16    | × | 10 |               | 45  | 180 |                   | 16 | 6   | 4,3  |                 |              |
| > | 58  | 65  | 18    | × | 11 |               | 50  | 200 | 18                | 7  | 4,4 |      |                 |              |
| > | 65  | 75  | 20    | × | 12 |               | 56  | 110 | 0,6<br>0,8        | 20 | 7,5 | 4,9  |                 | 0,4<br>0,6   |
| > | 75  | 85  | 22    | × | 14 |               | 63  | 140 |                   | 22 | 9   | 5,4  |                 |              |
| > | 85  | 95  | 25    | × | 14 |               | 70  | 160 |                   | 25 | 9   | 5,4  |                 |              |
| > | 95  | 110 | 28    | × | 16 |               | 80  | 180 |                   | 28 | 10  | 6,4  |                 |              |
| > | 110 | 130 | 32    | × | 18 |               | 90  | 200 |                   | 32 | 11  | 7,4  |                 |              |
| > | 130 | 150 | 36    | × | 20 |               | 100 | 160 | 1<br>1,2          | 36 | 12  | 8,4  | 0,3<br>0        | 0,7<br>1     |
| > | 150 | 170 | 40    | × | 22 |               | 110 | 180 |                   | 40 | 13  | 9,4  |                 |              |
| > | 170 | 200 | 45    | × | 25 |               | 125 | 200 |                   | 45 | 14  | 10,4 |                 |              |

## 3.4 ELECTRIC MOTORS

## 3.4.1 Electric motors

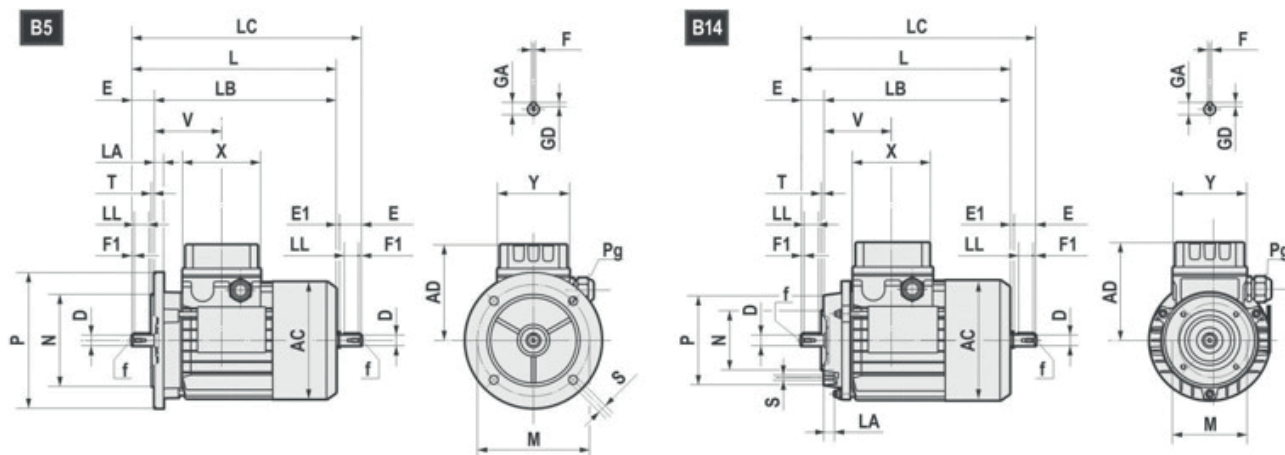


|      | AC  | AD  | L             | LB            | LC            | X   | Y   | V     | D     | E   | E1  | f       | F1  | GA   | F  | GD |
|------|-----|-----|---------------|---------------|---------------|-----|-----|-------|-------|-----|-----|---------|-----|------|----|----|
| 63   | 121 | 104 | 211           | 188           | 235,5         | 80  | 74  | 69    | 11 j6 | 23  | 1,5 | M4x10   | 2,5 | 12,5 | 4  | 4  |
| 71   | 139 | 112 | 238,5         | 208,5         | 271           | 80  | 74  | 74,5  | 14 j6 | 30  | 2,5 | M5x12.5 | 3   | 16   | 5  | 5  |
| 80   | 158 | 122 | 272,5<br>*296 | 232,5<br>*256 | 314<br>*337   | 80  | 74  | 78    | 19 j6 | 40  | 1,5 | M6x16   | 5   | 21,5 | 6  | 6  |
| 90S  | 173 | 148 | 298<br>*331   | 248<br>*281   | 349,5<br>*381 | 98  | 98  | 89,5  | 24 j6 | 50  | 1,5 | M8x19   | 5   | 27   | 8  | 7  |
| 90L  | 173 | 148 | 323<br>*356   | 273<br>*306   | 374,5<br>*408 | 98  | 98  | 89,5  | 24 j6 | 50  | 1,5 | M8x19   | 5   | 27   | 8  | 7  |
| 100  | 191 | 156 | 368           | 308           | 431,5         | 98  | 98  | 97,5  | 28 j6 | 60  | 3,5 | M10x22  | 7,5 | 31   | 8  | 7  |
| 112  | 211 | 171 | 382,5<br>*408 | 322,5<br>*348 | 447<br>*472   | 98  | 98  | 100   | 28 j6 | 60  | 3,5 | M10x22  | 7,5 | 31   | 8  | 7  |
| 132S | 249 | 195 | 452           | 372           | 536,5         | 118 | 118 | 115,5 | 38 k6 | 80  | 4   | M12x28  | 10  | 41   | 10 | 8  |
| 132L | 249 | 195 | 490           | 410           | 574,5         | 118 | 118 | 115,5 | 38 k6 | 80  | 4   | M12x28  | 10  | 41   | 10 | 8  |
| 160S | 249 | 195 | 520           | 410           | /             | 118 | 118 | 115,5 | 42k6  | 100 | /   | M16x36  | 10  | 45   | 12 | 8  |

\*TP80B4, SH80B4, HSH80B4, TP90S4, SH90S4, HSH90S4, TP90L4, SH90L4, HSH90L4, TP90S6, TP112M4, TP112M6

| B5  | M   | N   | P   | LA   | S    | T   | B14 | M   | N   | P   | LA   | S   | T   |
|-----|-----|-----|-----|------|------|-----|-----|-----|-----|-----|------|-----|-----|
| 63  | 115 | 95  | 140 | 10   | 9    | 3   | 63  | 75  | 60  | 90  | 10   | M5  | 2,5 |
| 71  | 130 | 110 | 160 | 10   | 9,5  | 3,5 | 71  | 85  | 70  | 105 | 10,5 | M6  | 2,5 |
| 80  | 165 | 130 | 200 | 12   | 11   | 3,5 | 80  | 100 | 80  | 120 | 10,5 | M6  | 3   |
| 90  | 165 | 130 | 200 | 12   | 11   | 3,5 | 90  | 115 | 95  | 140 | 11,5 | M8  | 3   |
| 100 | 215 | 180 | 250 | 15   | 14   | 4   | 100 | 130 | 110 | 160 | 15   | M8  | 3,5 |
| 112 | 215 | 180 | 250 | 14,5 | 14   | 4   | 112 | 130 | 110 | 160 | 11,5 | M8  | 3,5 |
| 132 | 265 | 230 | 300 | 20   | 14   | 3,5 | 132 | 165 | 130 | 200 | 20,5 | M10 | 3,5 |
| 160 | 300 | 250 | 350 | 13   | 18,5 | 3,5 | 160 | 215 | 180 | 250 | -    | M12 | 4   |

## 3.4 ELECTRIC MOTORS



|      |       | AC  | AD  | L    | LB  | X   | D  | E   | f   | GA   | F  | GD | LL  | Pg        |           |
|------|-------|-----|-----|------|-----|-----|----|-----|-----|------|----|----|-----|-----------|-----------|
| 160M | 2-4-6 | 314 | 251 | 600  | 490 | 158 | 42 | 110 | M16 | 45   | 12 | 8  | 90  | 2-M40x1,5 | 1-M16x1,5 |
| 160L | 2-4-6 | 314 | 251 | 645  | 535 | 158 | 42 | 110 | M16 | 45   | 12 | 8  | 90  | 2-M40x1,5 | 1-M16x1,5 |
| 180M | 2-4   | 355 | 267 | 680  | 570 | 158 | 48 | 110 | M16 | 51,5 | 14 | 9  | 100 | 2-M40x1,5 | 1-M16x1,5 |
| 180L | 4-6   | 355 | 267 | 720  | 610 | 158 | 48 | 110 | M16 | 51,5 | 14 | 9  | 100 | 2-M40x1,5 | 1-M16x1,5 |
| 200L | 2-4-6 | 397 | 300 | 785  | 675 | 187 | 55 | 110 | M20 | 59   | 16 | 10 | 100 | 2-M50x1,5 | 1-M16x1,5 |
| 225S | 4     | 446 | 325 | 820  | 680 | 187 | 60 | 140 | M20 | 64   | 18 | 11 | 125 | 2-M50x1,5 | 1-M16x1,5 |
| 225M | 2     | 446 | 325 | 815  | 705 | 187 | 55 | 110 | M20 | 59   | 16 | 10 | 100 | 2-M50x1,5 | 1-M16x1,5 |
| 225M | 4-6   | 446 | 325 | 845  | 705 | 187 | 60 | 140 | M20 | 64   | 18 | 11 | 125 | 2-M50x1,5 | 1-M16x1,5 |
| 250M | 2-4-6 | 485 | 360 | 910  | 770 | 238 | 60 | 140 | M20 | 64   | 18 | 11 | 125 | 2-M63x1,5 | 1-M16x1,5 |
| 250M | 2-4-6 | 485 | 360 | 910  | 770 | 238 | 65 | 140 | M20 | 69   | 18 | 11 | 125 | 2-M63x1,5 | 1-M16x1,5 |
| 280S | 2-4-6 | 547 | 390 | 970  | 830 | 238 | 65 | 140 | M20 | 69   | 18 | 11 | 125 | 2-M63x1,5 | 1-M16x1,5 |
| 280S | 2-4-6 | 547 | 390 | 970  | 830 | 238 | 75 | 140 | M20 | 79,5 | 20 | 12 | 125 | 2-M63x1,5 | 1-M16x1,5 |
| 280M | 2-4-6 | 547 | 390 | 1025 | 885 | 238 | 65 | 140 | M20 | 69   | 18 | 11 | 125 | 2-M63x1,5 | 1-M16x1,5 |
| 280M | 2-4-6 | 547 | 390 | 1025 | 885 | 238 | 75 | 140 | M20 | 79,5 | 20 | 12 | 125 | 2-M63x1,5 | 1-M16x1,5 |

| B5  | M   | N   | P   | LA | S  | T |
|-----|-----|-----|-----|----|----|---|
| 160 | 300 | 250 | 350 | 13 | 19 | 5 |
| 180 | 300 | 250 | 350 | 15 | 19 | 5 |
| 200 | 350 | 300 | 400 | 17 | 19 | 5 |
| 225 | 400 | 350 | 450 | 20 | 19 | 5 |
| 250 | 500 | 450 | 550 | 22 | 19 | 5 |
| 280 | 500 | 450 | 550 | 22 | 19 | 5 |

## 3.4.2 Standard high efficiency (TS), high (TH, SH, HSH) and premium (TP) motors

Motovario, three-phase, single polarity motors are available in three different versions (IE1-IE2-IE3) in compliance with standard 60034-30-1. The efficiency value is calculated according to the method set forth in standard IEC 60034-2-1.

1. IE1: TS series (standard efficiency) for nominal power less than 0,12 kW;
2. IE2: TH series (high efficiency) for nominal power greater than or equal to 0,12 kW and less than 0,75 kW;
3. IE3: TP series (premium efficiency) (\*) 4 poles for nominal power greater than or equal to 0,12 kW, 2 and 6 poles for nominal power greater than or equal to 0,75 kW.

Motovario single-phase, single-polarity motors are available in IE2 efficiency class according to IEC 60034-30-1 for nominal power ratings higher than or equal to 0,12 kW and lower than or equal to 2,2 kW. The efficiency value is calculated according to the method set forth in standard IEC 60034-2-1.

Table of Motovario commercial availability

| NOMINAL POWER [kW]     | EFFICIENCY LEVEL |                  |             |
|------------------------|------------------|------------------|-------------|
|                        | IE1              | IE2              | IE3         |
| $P_n < 0,12$           | TS-TBS           | -                | -           |
| $0,12 \leq P_n < 0,75$ | -                | TH-TBH<br>SH-HSH | TP-TBP (**) |
| $P_n \geq 0,75$        | -                | SH-HSH           | TP-TBP      |

(\*) Motor TP100LA4 2.2 kW and all TP 6 poles motors are available at 60Hz only upon request. As a consequence, these motors are in IE3 efficiency level at 50 Hz and IE2 at 60 Hz in case of bifrequency electrical design (standard 230/400-265/460V 50-60Hz and optional 200/346-220/380V 50-60Hz, 290/500-330/575V 50-60Hz and 400/690-460/800V 50-60Hz, see chapter on input voltage and frequency).

(\*\*) Only 4 poles.

## 3.4 ELECTRIC MOTORS

## 3.4.3 Nominal power - [kW]

|    | 63A  |      |      | 63B  |      | 63C  | 63D  | 71A  |      | 71B  |      | 71C  |
|----|------|------|------|------|------|------|------|------|------|------|------|------|
| P. | TS   | TH   | TP   | TH   | TP   | TH   | TH   | TH   | TP   | TH   | TP   | TH   |
| 2  | -    | 0,18 | -    | 0,25 | -    | 0,37 | -    | 0,37 | -    | 0,55 | -    | -    |
| 4  | -    | 0,12 | 0,12 | 0,18 | 0,18 | -    | 0,25 | 0,25 | 0,25 | 0,37 | 0,37 | 0,55 |
| 6  | 0,09 | -    | -    | 0,12 | -    | -    | -    | 0,18 | -    | 0,25 | -    | 0,37 |

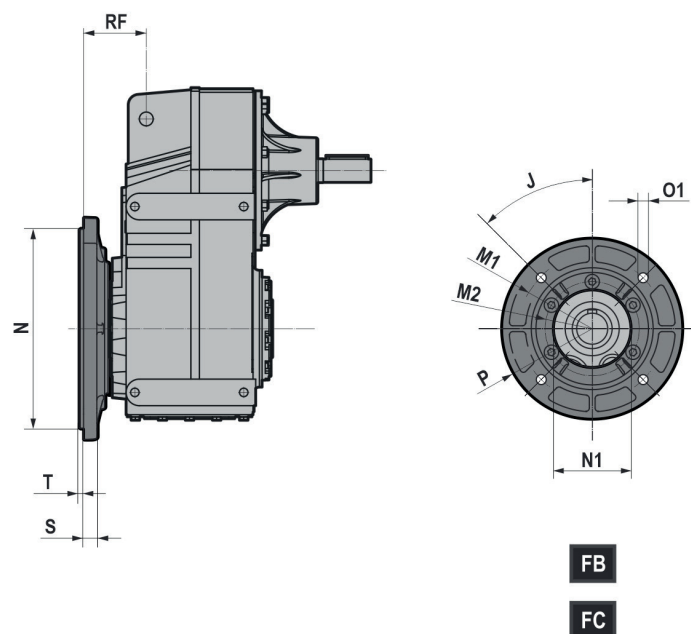
|    | 80A  |      | 80B  |      | 90S  | 90L | 100LR | 100LA | 100L | 112MR | 112MS | 112M |
|----|------|------|------|------|------|-----|-------|-------|------|-------|-------|------|
| P. | TH   | TP   | TH   | TP   | TP   | TP  | TP    | TP    | TP   | TP    | TP    | TP   |
| 2  | -    | 0,75 | -    | 1,1  | 1,5  | 2,2 | -     | -     | 3    | -     | -     | 4    |
| 4  | 0,55 | 0,55 | -    | 0,75 | 1,1  | 1,5 | -     | 2,2   | -    | 2,2   | 3     | 4    |
| 6  | 0,37 | -    | 0,55 | -    | 0,75 | -   | 1,1   | -     | 1,5  | -     | -     | 2,2  |

|    | 132S | 132MS | 132MA | 132MB | 132M |
|----|------|-------|-------|-------|------|
| P. | TP   | TP    | TP    | TP    | TP   |
| 2  | 5,5  | -     | -     | -     | 7,5  |
| 4  | -    | 5,5   | -     | -     | 7,5  |
| 6  | 3    | -     | 4     | 5,5   | -    |

|    | 160M | 160MA | 160MB | 160L | 160LA | 180M | 180L |
|----|------|-------|-------|------|-------|------|------|
| P. | TP   | TP    | TP    | TP   | TP    | TP   | TP   |
| 2  | -    | 11    | 15    | 18,5 | -     | 22   | -    |
| 4  | -    | 11    | -     | -    | 15    | 18,5 | 22   |
| 6  | 7,5  | -     | -     | 11   | -     | -    | 15   |

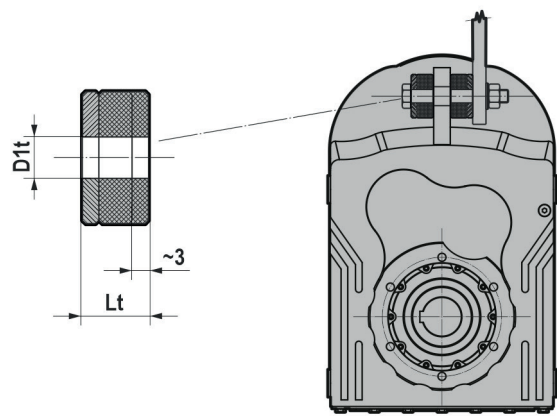
|    | 200L | 200LA | 200LB | 225S | 225M | 250M | 280S | 280M |
|----|------|-------|-------|------|------|------|------|------|
| P. | TP   | TP    | TP    | TP   | TP   | TP   | TP   | TP   |
| 2  | -    | 30    | 37    | -    | -    | -    | -    | -    |
| 4  | 30   | -     | -     | 37   | 45   | 55   | 75   | 90   |
| 6  | -    | 18,5  | 22    | -    | -    | -    | -    | -    |

## 4.2 OUTPUT FLANGE



|             |    | J     | M1  | N              | O1 | P   | S  | T | RF  |
|-------------|----|-------|-----|----------------|----|-----|----|---|-----|
| SN142/SN143 | FB | 45°   | 400 | 350-0,04/-0,02 | 18 | 450 | 20 | 5 | 126 |
|             | FC | 22,5° | 350 | 300-0,05/-0,02 | 18 | 400 | 20 | 5 | 126 |
| SN152/SN153 | FB | 22,5° | 400 | 350-0,05/-0,02 | 18 | 450 | 24 | 5 | 157 |
| SN162/SN163 | FB | 22,5° | 500 | 450-0,06/-0,02 | 18 | 550 | 26 | 5 | 200 |
| SN182/SN183 | FB | 22,5° | 600 | 550-0,06/-0,02 | 22 | 660 | 26 | 6 | 206 |

4.3.1 Reaction bolt



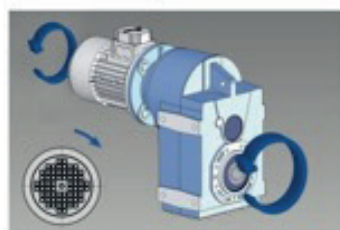
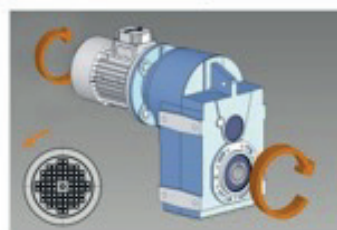
|             | D1t | Lt |
|-------------|-----|----|
| SN142/SN143 | 26  | 40 |
| SN152/SN153 | 26  | 40 |
| SN162/SN163 | 32  | 60 |
| SN182/SN183 | 32  | 60 |



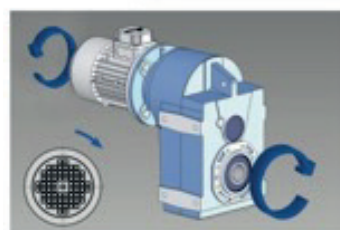
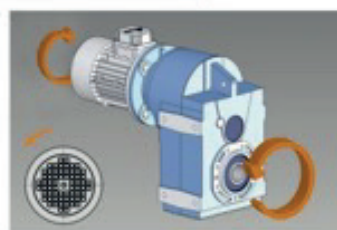
Gear reducers may be equipped with a backstop device. The backstop device allows shafts to rotate in one direction only. It is essential that while ordering you specify the direction of rotation required.

## DIRECTION OF ROTATION AVAILABLE

S... 2/C-D-L

**CLOCKWISE** IN RELATION  
TO THE INPUT SHAFT**ANTI-CLOCKWISE** IN RELATION  
TO THE INPUT SHAFT

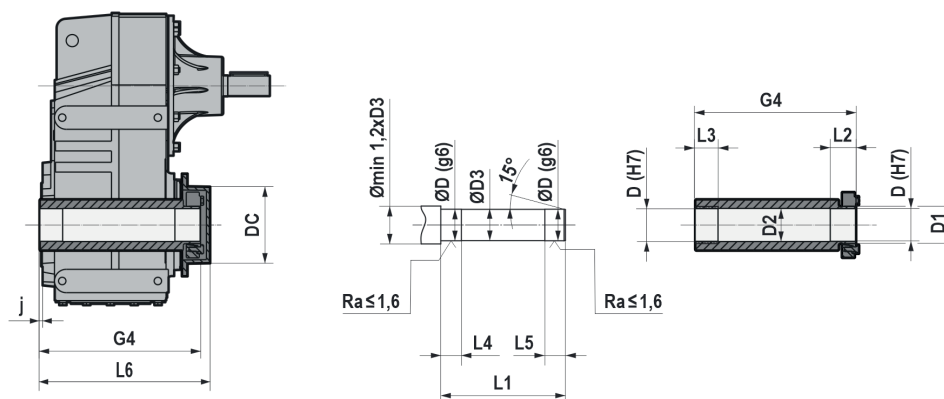
S... 3/C-D-L

**CLOCKWISE** IN RELATION  
TO THE INPUT SHAFT**ANTI-CLOCKWISE** IN RELATION  
TO THE INPUT SHAFT

Clean and degrease the surfaces of the shaft to be coupled to. Comply with the indicated tightening torque of screws ( $M_T$ ).

The shrink disc is designed only to transmit the output torque.

In case of radial and/or axial loads or V5-V6 mounting positions, please contact the technical support.

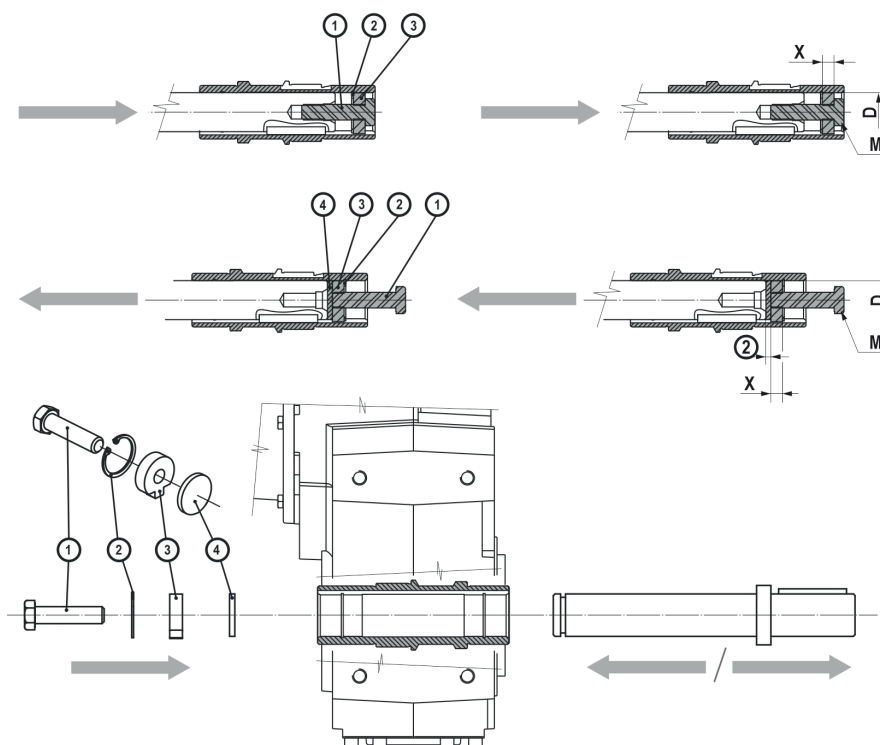


|             | DC  | D   | D1  | D2  | D3  | G4  | L1  | L2 | L3 | L4 | L5  | L6  | j   | $M_T$ 10.9 [Nm] |
|-------------|-----|-----|-----|-----|-----|-----|-----|----|----|----|-----|-----|-----|-----------------|
| SN142/SN143 | 164 | 70  | 80  | 71  | 69  | 345 | 348 | 55 | 50 | 55 | 63  | 366 | 6   | 30              |
| SN152/SN153 | 204 | 90  | 110 | 91  | 89  | 418 | 421 | 70 | 60 | 70 | 83  | 440 | 7,5 | 59              |
| SN162/SN163 | 252 | 110 | 140 | 111 | 109 | 492 | 495 | 80 | 70 | 80 | 93  | 519 | 9   | 100             |
| SN182/SN183 | 288 | 120 | 155 | 121 | 119 | 570 | 573 | 90 | 80 | 90 | 103 | 593 | 10  | 100             |

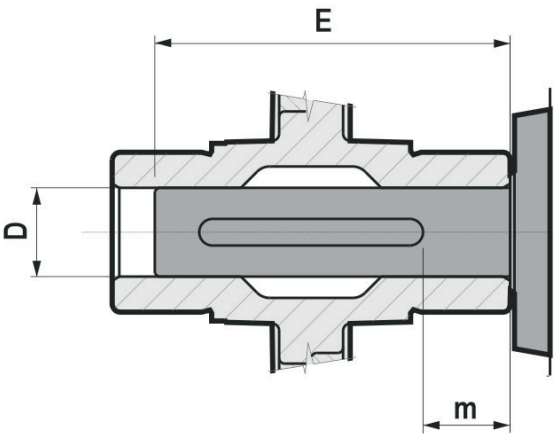
## 4.7 ASSEMBLING/DISASSEMBLING KIT

Assembly/disassembly kit for hollow shaft gear reducers with key that includes:

1. Fixing screw
2. Circlip
3. Fixed nut
4. Forcing washer



|             | D   | X  | M   |
|-------------|-----|----|-----|
| SN142/SN143 | 70  | 16 | M24 |
| SN152/SN153 | 90  | 20 | M30 |
| SN162/SN163 | 110 | 20 | M30 |
| SN182/SN183 | 120 | 20 | M30 |



|             | D h6 | E*  | m* |
|-------------|------|-----|----|
| SN142/SN143 | 70   | 248 | 5  |
| SN152/SN153 | 90   | 287 | 5  |
| SN162/SN163 | 110  | 347 | 5  |
| SN182/SN183 | 120  | 434 | 5  |

(\*) Suggested values.

## 5.1 SN GEARED MOTORS (50Hz)

| 1,50 kW        |               |     |        |                   |                     |                |               |
|----------------|---------------|-----|--------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i      | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 4,3            | 3111          | 1,4 | 221,47 | SN143             | 100L/6              | 955            | 39600         |
| 4,8            | 2771          | 1,6 | 197,01 | SN143             | 100L/6              | 955            | 41834         |
| 5,7            | 2365          | 1,8 | 167,96 | SN143             | 100L/6              | 955            | 44147         |
| 6,8            | 1969          | 2,2 | 139,76 | SN143             | 100L/6              | 955            | 46253         |
| 7,7            | 1756          | 2,4 | 124,53 | SN143             | 100L/6              | 955            | 47295         |
| 7,7            | 1756          | 2,4 | 124,53 | SN143             | 100L/6              | 955            | 47295         |
| 4,3            | 3124          | 2,6 | 222,16 | SN153             | 100L/6              | 955            | 79856         |
| 5,0            | 2678          | 3,0 | 190,20 | SN153             | 100L/6              | 955            | 81373         |
| 6,0            | 2228          | 3,6 | 158,23 | SN153             | 100L/6              | 955            | 82813         |

| 2,20 kW        |               |     |        |                   |                     |                |               |
|----------------|---------------|-----|--------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i      | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 6,5            | 3018          | 1,4 | 221,47 | SN143             | 100L/4a             | 1450           | 40162         |
| 7,4            | 2688          | 1,6 | 197,01 | SN143             | 100L/4a             | 1450           | 42343         |
| 8,6            | 2295          | 1,9 | 167,96 | SN143             | 100L/4a             | 1450           | 44618         |
| 10,4           | 1910          | 2,3 | 139,76 | SN143             | 100L/4a             | 1450           | 46564         |
| 11,6           | 1704          | 2,5 | 124,53 | SN143             | 100L/4a             | 1450           | 47556         |
| 4,4            | 4522          | 1,0 | 221,47 | SN143             | 112M/6              | 965            | 26935         |
| 4,9            | 4027          | 1,1 | 197,01 | SN143             | 112M/6              | 965            | 32204         |
| 5,7            | 3438          | 1,3 | 167,96 | SN143             | 112M/6              | 965            | 37227         |
| 6,5            | 3030          | 2,6 | 222,16 | SN153             | 100L/4a             | 1450           | 80200         |
| 7,6            | 2598          | 3,1 | 190,20 | SN153             | 100L/4a             | 1450           | 81650         |
| 9,2            | 2162          | 3,7 | 158,23 | SN153             | 100L/4a             | 1450           | 83029         |
| 4,3            | 4540          | 1,8 | 222,16 | SN153             | 112M/6              | 965            | 74383         |
| 5,1            | 3892          | 2,1 | 190,20 | SN153             | 112M/6              | 965            | 77017         |
| 6,1            | 3239          | 2,5 | 158,23 | SN153             | 112M/6              | 965            | 79451         |

| 3,00 kW        |               |     |        |                   |                     |                |               |
|----------------|---------------|-----|--------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i      | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 6,5            | 4118          | 1,0 | 221,47 | SN143             | 100L/4b             | 1450           | 31316         |
| 7,4            | 3668          | 1,2 | 197,01 | SN143             | 100L/4b             | 1450           | 35396         |
| 8,6            | 3131          | 1,4 | 167,96 | SN143             | 100L/4b             | 1450           | 39385         |
| 10,4           | 2607          | 1,6 | 139,76 | SN143             | 100L/4b             | 1450           | 42832         |
| 11,6           | 2325          | 1,8 | 124,53 | SN143             | 100L/4b             | 1450           | 44444         |
| 5,8            | 4660          | 0,9 | 167,96 | SN143             | 132S/6              | 970            | 25164         |
| 14,0           | 1928          | 2,2 | 69,18  | SN143             | 132S/6              | 970            | 46507         |
| 15,9           | 1697          | 2,5 | 60,82  | SN143             | 132S/6              | 970            | 47615         |
| 16,3           | 1655          | 2,6 | 59,34  | SN143             | 132S/6              | 970            | 47810         |
| 19,0           | 1425          | 3,0 | 51,01  | SN143             | 132S/6              | 970            | 48832         |
| 21,9           | 1238          | 3,5 | 44,27  | SN143             | 132S/6              | 970            | 49622         |

## 5.1 SN GEARED MOTORS (50Hz)

| 3,00 kW                 |                        |     |        |                   |                     |                         |                        |
|-------------------------|------------------------|-----|--------|-------------------|---------------------|-------------------------|------------------------|
| n <sub>2</sub><br>[rpm] | M <sub>2</sub><br>[Nm] | sf  | i      | Gear reduc-<br>er | Motor<br>Size/Poles | n <sub>1</sub><br>[rpm] | Fr <sub>2</sub><br>[N] |
| 25,1                    | 1084                   | 4,0 | 38,70  | SN143             | 132S/6              | 970                     | 50245                  |
| 6,5                     | 4135                   | 1,9 | 222,16 | SN153             | 100L/4b             | 1450                    | 76089                  |
| 7,6                     | 3545                   | 2,3 | 190,20 | SN153             | 100L/4b             | 1450                    | 78360                  |
| 9,2                     | 2950                   | 2,7 | 158,23 | SN153             | 100L/4b             | 1450                    | 80474                  |
| 10,2                    | 2642                   | 3,0 | 141,55 | SN153             | 100L/4b             | 1450                    | 81498                  |
| 4,4                     | 6153                   | 1,3 | 222,16 | SN153             | 132S/6              | 970                     | 66852                  |
| 5,1                     | 5275                   | 1,5 | 190,20 | SN153             | 132S/6              | 970                     | 71217                  |
| 6,1                     | 4390                   | 1,8 | 158,23 | SN153             | 132S/6              | 970                     | 75104                  |

| 4,00 kW                 |                        |     |        |                   |                     |                         |                        |
|-------------------------|------------------------|-----|--------|-------------------|---------------------|-------------------------|------------------------|
| n <sub>2</sub><br>[rpm] | M <sub>2</sub><br>[Nm] | sf  | i      | Gear reduc-<br>er | Motor<br>Size/Poles | n <sub>1</sub><br>[rpm] | Fr <sub>2</sub><br>[N] |
| 7,4                     | 4858                   | 0,9 | 197,01 | SN143             | 112M/4              | 1460                    | 22387                  |
| 8,7                     | 4148                   | 1,0 | 167,96 | SN143             | 112M/4              | 1460                    | 31041                  |
| 10,4                    | 3453                   | 1,2 | 139,76 | SN143             | 112M/4              | 1460                    | 37109                  |
| 11,7                    | 3080                   | 1,4 | 124,53 | SN143             | 112M/4              | 1460                    | 39813                  |
| 14,0                    | 2573                   | 1,7 | 69,18  | SN143             | 132M/6a             | 970                     | 43022                  |
| 15,9                    | 2265                   | 1,9 | 60,82  | SN143             | 132M/6a             | 970                     | 44766                  |
| 16,3                    | 2209                   | 1,9 | 59,34  | SN143             | 132M/6a             | 970                     | 45068                  |
| 19,0                    | 1902                   | 2,3 | 51,01  | SN143             | 132M/6a             | 970                     | 46637                  |
| 21,9                    | 1653                   | 2,6 | 44,27  | SN143             | 132M/6a             | 970                     | 47819                  |
| 25,1                    | 1447                   | 3,0 | 38,70  | SN143             | 132M/6a             | 970                     | 48713                  |
| 28,5                    | 1273                   | 3,4 | 34,02  | SN143             | 132M/6a             | 970                     | 49524                  |
| 6,6                     | 5477                   | 1,5 | 222,16 | SN153             | 112M/4              | 1460                    | 70275                  |
| 7,7                     | 4696                   | 1,7 | 190,20 | SN153             | 112M/4              | 1460                    | 73725                  |
| 9,2                     | 3908                   | 2,0 | 158,23 | SN153             | 112M/4              | 1460                    | 76929                  |
| 10,3                    | 3500                   | 2,3 | 141,55 | SN153             | 112M/4              | 1460                    | 78480                  |
| 4,4                     | 8212                   | 1,0 | 222,16 | SN153             | 132M/6a             | 970                     | 53965                  |
| 5,1                     | 7040                   | 1,1 | 190,20 | SN153             | 132M/6a             | 970                     | 61827                  |
| 6,1                     | 5859                   | 1,4 | 158,23 | SN153             | 132M/6a             | 970                     | 68379                  |
| 11,9                    | 3038                   | 2,6 | 81,72  | SN153             | 132M/6a             | 970                     | 80178                  |
| 13,4                    | 2698                   | 3,0 | 72,50  | SN153             | 132M/6a             | 970                     | 81433                  |
| 7,6                     | 4757                   | 2,7 | 128,20 | SN163             | 132M/6a             | 970                     | 108689                 |
| 8,4                     | 4273                   | 3,0 | 115,03 | SN163             | 132M/6a             | 970                     | 109905                 |
| 9,6                     | 3749                   | 3,5 | 101,03 | SN163             | 132M/6a             | 970                     | 111224                 |
| 11,0                    | 3269                   | 4,0 | 87,95  | SN163             | 132M/6a             | 970                     | 112387                 |

## 5.1 SN GEARED MOTORS (50Hz)

| 5,50 kW        |               |     |        |                   |                     |                |               |
|----------------|---------------|-----|--------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i      | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 10,4           | 4749          | 0,9 | 139,76 | SN143             | 132S/4              | 1460           | 23996         |
| 11,7           | 4236          | 1,0 | 124,53 | SN143             | 132S/4              | 1460           | 30119         |
| 13,8           | 3606          | 1,2 | 106,08 | SN143             | 132S/4              | 1460           | 35903         |
| 16,0           | 3105          | 1,4 | 91,19  | SN143             | 132S/4              | 1460           | 39572         |
| 18,4           | 2698          | 1,6 | 79,14  | SN143             | 132S/4              | 1460           | 42224         |
| 21,1           | 2362          | 1,8 | 69,18  | SN143             | 132S/4              | 1460           | 44240         |
| 24,0           | 2079          | 2,1 | 60,82  | SN143             | 132S/4              | 1460           | 45753         |
| 24,6           | 2027          | 2,1 | 59,34  | SN143             | 132S/4              | 1460           | 46036         |
| 28,6           | 1746          | 2,5 | 51,01  | SN143             | 132S/4              | 1460           | 47360         |
| 33,0           | 1517          | 2,8 | 44,27  | SN143             | 132S/4              | 1460           | 48408         |
| 37,7           | 1328          | 3,2 | 38,70  | SN143             | 132S/4              | 1460           | 49229         |
| 42,9           | 1169          | 3,7 | 34,02  | SN143             | 132S/4              | 1460           | 49888         |
| 5,1            | 9687          | 0,8 | 190,20 | SN153             | 132M/6b             | 970            | 40559         |
| 6,1            | 8062          | 1,0 | 158,23 | SN153             | 132M/6b             | 970            | 55041         |
| 6,6            | 7531          | 1,1 | 222,16 | SN153             | 132S/4              | 1460           | 58725         |
| 7,7            | 6457          | 1,2 | 190,20 | SN153             | 132S/4              | 1460           | 65096         |
| 9,2            | 5375          | 1,5 | 158,23 | SN153             | 132S/4              | 1460           | 70674         |
| 10,3           | 4813          | 1,7 | 141,55 | SN153             | 132S/4              | 1460           | 73313         |
| 11,9           | 4159          | 1,9 | 122,41 | SN153             | 132S/4              | 1460           | 76114         |
| 13,8           | 3607          | 2,2 | 105,99 | SN153             | 132S/4              | 1460           | 78129         |
| 15,7           | 3159          | 2,5 | 92,70  | SN153             | 132S/4              | 1460           | 79752         |
| 17,9           | 2788          | 2,9 | 81,72  | SN153             | 132S/4              | 1460           | 81023         |
| 20,1           | 2476          | 3,2 | 72,50  | SN153             | 132S/4              | 1460           | 82044         |
| 7,6            | 6545          | 2,0 | 128,20 | SN163             | 132M/6b             | 970            | 103371        |
| 8,4            | 5880          | 2,2 | 115,03 | SN163             | 132M/6b             | 970            | 105394        |
| 9,6            | 5160          | 2,5 | 101,03 | SN163             | 132M/6b             | 970            | 107474        |
| 11,0           | 4499          | 2,9 | 87,95  | SN163             | 132M/6b             | 970            | 109257        |
| 11,4           | 4365          | 3,0 | 128,20 | SN163             | 132S/4              | 1460           | 109629        |
| 12,7           | 3921          | 3,3 | 115,03 | SN163             | 132S/4              | 1460           | 110765        |
| 14,5           | 3441          | 3,8 | 101,03 | SN163             | 132S/4              | 1460           | 111948        |

## 5.1 SN GEARED MOTORS (50Hz)

| 7,50 kW        |               |     |        |                   |                     |                |               |
|----------------|---------------|-----|--------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i      | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 56,1           | 1233          | 3,5 | 26,11  | SN142             | 132M/4              | 1465           | 49626         |
| 62,7           | 1104          | 3,9 | 23,36  | SN142             | 132M/4              | 1465           | 50149         |
| 13,8           | 4902          | 0,9 | 106,08 | SN143             | 132M/4              | 1465           | 21751         |
| 16,1           | 4221          | 1,0 | 91,19  | SN143             | 132M/4              | 1465           | 30278         |
| 18,5           | 3668          | 1,2 | 79,14  | SN143             | 132M/4              | 1465           | 35393         |
| 21,2           | 3211          | 1,3 | 69,18  | SN143             | 132M/4              | 1465           | 38825         |
| 24,1           | 2826          | 1,5 | 60,82  | SN143             | 132M/4              | 1465           | 41425         |
| 24,7           | 2756          | 1,6 | 59,34  | SN143             | 132M/4              | 1465           | 41865         |
| 28,7           | 2373          | 1,8 | 51,01  | SN143             | 132M/4              | 1465           | 44128         |
| 33,1           | 2063          | 2,1 | 44,27  | SN143             | 132M/4              | 1465           | 45805         |
| 37,9           | 1806          | 2,4 | 38,70  | SN143             | 132M/4              | 1465           | 47074         |
| 43,1           | 1590          | 2,7 | 34,02  | SN143             | 132M/4              | 1465           | 48083         |
| 7,7            | 8778          | 0,9 | 190,20 | SN153             | 132M/4              | 1465           | 49412         |
| 9,3            | 7306          | 1,1 | 158,23 | SN153             | 132M/4              | 1465           | 60185         |
| 10,3           | 6543          | 1,2 | 141,55 | SN153             | 132M/4              | 1465           | 64613         |
| 12,0           | 5654          | 1,4 | 122,41 | SN153             | 132M/4              | 1465           | 69316         |
| 13,8           | 4903          | 1,6 | 105,99 | SN153             | 132M/4              | 1465           | 72842         |
| 15,8           | 4294          | 1,9 | 92,70  | SN153             | 132M/4              | 1465           | 75467         |
| 17,9           | 3790          | 2,1 | 81,72  | SN153             | 132M/4              | 1465           | 77436         |
| 20,2           | 3366          | 2,4 | 72,50  | SN153             | 132M/4              | 1465           | 79012         |
| 23,2           | 2938          | 2,7 | 41,85  | SN153             | 160M/6              | 970            | 80447         |
| 26,1           | 2609          | 3,1 | 37,12  | SN153             | 160M/6              | 970            | 81553         |
| 29,3           | 2329          | 3,4 | 33,10  | SN153             | 160M/6              | 970            | 81723         |
| 30,4           | 2244          | 3,6 | 31,92  | SN153             | 160M/6              | 970            | 80959         |
| 35,1           | 1947          | 4,0 | 27,65  | SN153             | 160M/6              | 970            | 77981         |
| 11,4           | 5934          | 2,2 | 128,20 | SN163             | 132M/4              | 1465           | 105268        |
| 12,7           | 5330          | 2,4 | 115,03 | SN163             | 132M/4              | 1465           | 107010        |
| 14,5           | 4678          | 2,8 | 101,03 | SN163             | 132M/4              | 1465           | 108802        |
| 16,7           | 4079          | 3,2 | 87,95  | SN163             | 132M/4              | 1465           | 110365        |
| 18,9           | 3593          | 3,6 | 77,36  | SN163             | 132M/4              | 1465           | 111578        |
| 7,6            | 8928          | 1,5 | 128,20 | SN163             | 160M/6              | 970            | 95338         |
| 8,4            | 8020          | 1,6 | 115,03 | SN163             | 160M/6              | 970            | 98632         |
| 9,6            | 7038          | 1,8 | 101,03 | SN163             | 160M/6              | 970            | 101926        |
| 5,1            | 13330         | 1,4 | 191,74 | SN183             | 160M/6              | 970            | 213157        |
| 5,7            | 11902         | 1,5 | 171,00 | SN183             | 160M/6              | 970            | 216210        |
| 6,3            | 10721         | 1,7 | 153,87 | SN183             | 160M/6              | 970            | 218856        |
| 7,1            | 9484          | 1,9 | 136,23 | SN183             | 160M/6              | 970            | 221480        |
| 8,1            | 8307          | 2,2 | 119,15 | SN183             | 160M/6              | 970            | 216491        |
| 9,2            | 7353          | 2,4 | 105,33 | SN183             | 160M/6              | 970            | 209704        |
| 10,3           | 6563          | 2,7 | 93,91  | SN183             | 160M/6              | 970            | 203492        |
| 11,5           | 5899          | 3,1 | 84,31  | SN183             | 160M/6              | 970            | 197762        |
| 13,5           | 5030          | 3,6 | 71,87  | SN183             | 160M/6              | 970            | 189465        |



## 5.1 SN GEARED MOTORS (50Hz)

| 11,00 kW       |               |     |        |                   |                     |                |               |
|----------------|---------------|-----|--------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i      | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 56,3           | 1803          | 2,4 | 26,11  | SN142             | 160M/4              | 1470           | 47106         |
| 62,9           | 1615          | 2,7 | 23,36  | SN142             | 160M/4              | 1470           | 47994         |
| 72,8           | 1395          | 3,1 | 20,20  | SN142             | 160M/4              | 1470           | 48964         |
| 84,0           | 1210          | 3,6 | 17,49  | SN142             | 160M/4              | 1470           | 49740         |
| 21,2           | 4694          | 0,9 | 69,18  | SN143             | 160M/4              | 1470           | 24752         |
| 24,2           | 4132          | 1,0 | 60,82  | SN143             | 160M/4              | 1470           | 31197         |
| 24,8           | 4030          | 1,1 | 59,34  | SN143             | 160M/4              | 1470           | 32186         |
| 28,8           | 3470          | 1,2 | 51,01  | SN143             | 160M/4              | 1470           | 36977         |
| 33,2           | 3016          | 1,4 | 44,27  | SN143             | 160M/4              | 1470           | 40245         |
| 38,0           | 2640          | 1,6 | 38,70  | SN143             | 160M/4              | 1470           | 42628         |
| 43,2           | 2324          | 1,9 | 34,02  | SN143             | 160M/4              | 1470           | 44445         |
| 48,9           | 2055          | 2,1 | 30,04  | SN143             | 160M/4              | 1470           | 45809         |
| 10,4           | 9566          | 0,8 | 141,55 | SN153             | 160M/4              | 1470           | 42043         |
| 12,0           | 8267          | 1,0 | 122,41 | SN153             | 160M/4              | 1470           | 53529         |
| 13,9           | 7169          | 1,1 | 105,99 | SN153             | 160M/4              | 1470           | 61044         |
| 15,9           | 6279          | 1,3 | 92,70  | SN153             | 160M/4              | 1470           | 66194         |
| 18,0           | 5542          | 1,4 | 81,72  | SN153             | 160M/4              | 1470           | 69958         |
| 20,3           | 4922          | 1,6 | 72,50  | SN153             | 160M/4              | 1470           | 72832         |
| 22,7           | 4393          | 1,8 | 64,64  | SN153             | 160M/4              | 1470           | 75095         |
| 23,6           | 4233          | 1,9 | 62,33  | SN153             | 160M/4              | 1470           | 75673         |
| 27,2           | 3672          | 2,2 | 53,99  | SN153             | 160M/4              | 1470           | 78025         |
| 31,3           | 3200          | 2,5 | 46,99  | SN153             | 160M/4              | 1470           | 78160         |
| 35,1           | 2856          | 2,8 | 41,85  | SN153             | 160M/4              | 1470           | 76007         |
| 39,6           | 2537          | 3,2 | 37,12  | SN153             | 160M/4              | 1470           | 73800         |
| 44,4           | 2265          | 3,5 | 33,10  | SN153             | 160M/4              | 1470           | 71706         |
| 46,1           | 2182          | 3,7 | 31,92  | SN153             | 160M/4              | 1470           | 71048         |
| 7,6            | 13102         | 1,0 | 128,20 | SN163             | 160L/6              | 970            | 76189         |
| 8,4            | 11769         | 1,1 | 115,03 | SN163             | 160L/6              | 970            | 83159         |
| 9,6            | 10328         | 1,3 | 101,03 | SN163             | 160L/6              | 970            | 89728         |
| 11,5           | 8675          | 1,5 | 128,20 | SN163             | 160M/4              | 1470           | 96275         |
| 12,8           | 7793          | 1,7 | 115,03 | SN163             | 160M/4              | 1470           | 99413         |
| 14,6           | 6839          | 1,9 | 101,03 | SN163             | 160M/4              | 1470           | 102535        |
| 16,7           | 5964          | 2,2 | 87,95  | SN163             | 160M/4              | 1470           | 105238        |
| 19,0           | 5253          | 2,5 | 77,36  | SN163             | 160M/4              | 1470           | 107277        |
| 21,4           | 4665          | 2,8 | 68,62  | SN163             | 160M/4              | 1470           | 108878        |
| 24,0           | 4171          | 3,1 | 61,27  | SN163             | 160M/4              | 1470           | 110166        |
| 26,7           | 3749          | 3,5 | 55,01  | SN163             | 160M/4              | 1470           | 111226        |
| 28,3           | 3537          | 3,7 | 51,94  | SN163             | 160M/4              | 1470           | 111744        |
| 5,1            | 19562         | 0,9 | 191,74 | SN183             | 160L/6              | 970            | 195964        |

## 5.1 SN GEARED MOTORS (50Hz)

| 11,00 kW       |               |     |        |                   |                     |                |               |
|----------------|---------------|-----|--------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i      | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 5,7            | 17467         | 1,0 | 171,00 | SN183             | 160L/6              | 970            | 201979        |
| 6,3            | 15733         | 1,1 | 153,87 | SN183             | 160L/6              | 970            | 206831        |
| 7,1            | 13918         | 1,3 | 136,23 | SN183             | 160L/6              | 970            | 211539        |
| 7,7            | 12950         | 1,4 | 191,74 | SN183             | 160M/4              | 1470           | 213002        |
| 8,6            | 11564         | 1,6 | 171,00 | SN183             | 160M/4              | 1470           | 207413        |
| 9,6            | 10417         | 1,7 | 153,87 | SN183             | 160M/4              | 1470           | 202265        |
| 12,3           | 8073          | 2,2 | 119,15 | SN183             | 160M/4              | 1470           | 189920        |
| 14,0           | 7146          | 2,5 | 105,33 | SN183             | 160M/4              | 1470           | 184068        |
| 15,7           | 6379          | 2,8 | 93,91  | SN183             | 160M/4              | 1470           | 178699        |
| 17,4           | 5733          | 3,1 | 84,31  | SN183             | 160M/4              | 1470           | 173736        |
| 20,5           | 4889          | 3,7 | 71,87  | SN183             | 160M/4              | 1470           | 166537        |

| 15,00 kW       |               |     |        |                   |                     |                |               |
|----------------|---------------|-----|--------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i      | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 56,3           | 2460          | 1,7 | 26,11  | SN142             | 160L/4              | 1470           | 43734         |
| 62,9           | 2203          | 2,0 | 23,36  | SN142             | 160L/4              | 1470           | 45142         |
| 72,8           | 1903          | 2,3 | 20,20  | SN142             | 160L/4              | 1470           | 46607         |
| 84,0           | 1650          | 2,6 | 17,49  | SN142             | 160L/4              | 1470           | 47858         |
| 96,1           | 1445          | 3,0 | 15,30  | SN142             | 160L/4              | 1470           | 48770         |
| 109,0          | 1275          | 3,3 | 13,48  | SN142             | 160L/4              | 1470           | 49694         |
| 122,9          | 1132          | 3,6 | 11,96  | SN142             | 160L/4              | 1470           | 51109         |
| 137,8          | 1010          | 3,8 | 10,67  | SN142             | 160L/4              | 1470           | 50313         |
| 142,9          | 973           | 3,9 | 10,29  | SN142             | 160L/4              | 1470           | 49831         |
| 28,8           | 4733          | 0,9 | 51,01  | SN143             | 160L/4              | 1470           | 24222         |
| 33,2           | 4114          | 1,0 | 44,27  | SN143             | 160L/4              | 1470           | 31358         |
| 38,0           | 3601          | 1,2 | 38,70  | SN143             | 160L/4              | 1470           | 36035         |
| 43,2           | 3170          | 1,4 | 34,02  | SN143             | 160L/4              | 1470           | 39262         |
| 48,9           | 2802          | 1,5 | 30,04  | SN143             | 160L/4              | 1470           | 41693         |
| 13,9           | 9778          | 0,8 | 105,99 | SN153             | 160L/4              | 1470           | 39792         |
| 15,9           | 8563          | 0,9 | 92,70  | SN153             | 160L/4              | 1470           | 51192         |
| 18,0           | 7559          | 1,1 | 81,72  | SN153             | 160L/4              | 1470           | 58545         |
| 20,3           | 6713          | 1,2 | 72,50  | SN153             | 160L/4              | 1470           | 63899         |
| 22,7           | 5992          | 1,3 | 64,64  | SN153             | 160L/4              | 1470           | 67809         |
| 23,6           | 5773          | 1,4 | 62,33  | SN153             | 160L/4              | 1470           | 68915         |
| 27,2           | 5008          | 1,6 | 53,99  | SN153             | 160L/4              | 1470           | 72524         |
| 31,3           | 4364          | 1,8 | 46,99  | SN153             | 160L/4              | 1470           | 75276         |
| 35,1           | 3896          | 2,1 | 41,85  | SN153             | 160L/4              | 1470           | 73747         |
| 39,6           | 3461          | 2,3 | 37,12  | SN153             | 160L/4              | 1470           | 71803         |

## 5.1 SN GEARED MOTORS (50Hz)

| 15,00 kW       |               |     |        |                   |                     |                |               |
|----------------|---------------|-----|--------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i      | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 44,4           | 3089          | 2,6 | 33,10  | SN153             | 160L/4              | 1470           | 69933         |
| 46,1           | 2977          | 2,7 | 31,92  | SN153             | 160L/4              | 1470           | 69340         |
| 53,2           | 2582          | 3,1 | 27,65  | SN153             | 160L/4              | 1470           | 67002         |
| 61,1           | 2250          | 3,6 | 24,06  | SN153             | 160L/4              | 1470           | 64756         |
| 11,5           | 11832         | 1,1 | 128,20 | SN163             | 160L/4              | 1470           | 83040         |
| 12,8           | 10629         | 1,2 | 115,03 | SN163             | 160L/4              | 1470           | 88576         |
| 14,6           | 9328          | 1,4 | 101,03 | SN163             | 160L/4              | 1470           | 93920         |
| 16,7           | 8134          | 1,6 | 87,95  | SN163             | 160L/4              | 1470           | 98325         |
| 19,0           | 7165          | 1,8 | 77,36  | SN163             | 160L/4              | 1470           | 101590        |
| 21,4           | 6363          | 2,0 | 68,62  | SN163             | 160L/4              | 1470           | 104135        |
| 24,0           | 5689          | 2,3 | 61,27  | SN163             | 160L/4              | 1470           | 106096        |
| 26,7           | 5113          | 2,5 | 55,01  | SN163             | 160L/4              | 1470           | 107712        |
| 28,3           | 4825          | 2,7 | 51,94  | SN163             | 160L/4              | 1470           | 108496        |
| 32,4           | 4224          | 3,1 | 45,41  | SN163             | 160L/4              | 1470           | 110068        |
| 36,8           | 3718          | 3,5 | 39,92  | SN163             | 160L/4              | 1470           | 111333        |
| 41,7           | 3286          | 4,0 | 35,24  | SN163             | 160L/4              | 1470           | 112372        |
| 7,7            | 17662         | 1,0 | 191,74 | SN183             | 160L/4              | 1470           | 201861        |
| 8,6            | 15771         | 1,1 | 171,00 | SN183             | 160L/4              | 1470           | 200345        |
| 9,6            | 14207         | 1,3 | 153,87 | SN183             | 160L/4              | 1470           | 195935        |
| 10,8           | 12569         | 1,4 | 136,23 | SN183             | 160L/4              | 1470           | 190782        |
| 12,3           | 11010         | 1,6 | 119,15 | SN183             | 160L/4              | 1470           | 185067        |
| 14,0           | 9746          | 1,8 | 105,33 | SN183             | 160L/4              | 1470           | 179796        |
| 15,7           | 8700          | 2,1 | 93,91  | SN183             | 160L/4              | 1470           | 174905        |
| 17,4           | 7820          | 2,3 | 84,31  | SN183             | 160L/4              | 1470           | 170340        |
| 20,5           | 6668          | 2,7 | 71,87  | SN183             | 160L/4              | 1470           | 163654        |
| 23,2           | 5886          | 3,1 | 63,36  | SN183             | 160L/4              | 1470           | 158457        |
| 26,2           | 5228          | 3,4 | 56,21  | SN183             | 160L/4              | 1470           | 153599        |
| 6,3            | 21348         | 0,8 | 153,87 | SN183             | 180L/6              | 975            | 190136        |
| 7,2            | 18885         | 1,0 | 136,23 | SN183             | 180L/6              | 975            | 198061        |

| 18,50 kW       |               |     |       |                   |                     |                |               |
|----------------|---------------|-----|-------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 56,5           | 3024          | 1,4 | 26,11 | SN142             | 180M/4              | 1475           | 40194         |
| 63,1           | 2708          | 1,6 | 23,36 | SN142             | 180M/4              | 1475           | 42220         |
| 73,0           | 2339          | 1,8 | 20,20 | SN142             | 180M/4              | 1475           | 44361         |
| 84,3           | 2029          | 2,1 | 17,49 | SN142             | 180M/4              | 1475           | 46006         |
| 96,4           | 1776          | 2,4 | 15,30 | SN142             | 180M/4              | 1475           | 47287         |
| 109,4          | 1568          | 2,7 | 13,48 | SN142             | 180M/4              | 1475           | 48429         |

## 5.1 SN GEARED MOTORS (50Hz)

| 18,50 kW       |               |     |        |                   |                     |                |               |
|----------------|---------------|-----|--------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i      | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 123,3          | 1392          | 2,9 | 11,96  | SN142             | 180M/4              | 1475           | 50093         |
| 138,3          | 1242          | 3,1 | 10,67  | SN142             | 180M/4              | 1475           | 49662         |
| 143,4          | 1197          | 3,2 | 10,29  | SN142             | 180M/4              | 1475           | 49202         |
| 165,5          | 1038          | 3,4 | 8,91   | SN142             | 180M/4              | 1475           | 47408         |
| 190,2          | 904           | 3,7 | 7,75   | SN142             | 180M/4              | 1475           | 45708         |
| 198,1          | 868           | 3,3 | 7,45   | SN142             | 180M/4              | 1475           | 45019         |
| 223,2          | 771           | 3,5 | 6,61   | SN142             | 180M/4              | 1475           | 43618         |
| 250,4          | 688           | 3,7 | 5,89   | SN142             | 180M/4              | 1475           | 42302         |
| 259,7          | 663           | 3,8 | 5,68   | SN142             | 180M/4              | 1475           | 41890         |
| 33,3           | 5057          | 0,9 | 44,27  | SN143             | 180M/4              | 1475           | 19234         |
| 38,1           | 4427          | 1,0 | 38,70  | SN143             | 180M/4              | 1475           | 28011         |
| 43,4           | 3897          | 1,1 | 34,02  | SN143             | 180M/4              | 1475           | 33413         |
| 49,1           | 3445          | 1,2 | 30,04  | SN143             | 180M/4              | 1475           | 37171         |
| 64,8           | 2638          | 3,0 | 22,77  | SN152             | 180M/4              | 1475           | 62824         |
| 74,4           | 2299          | 3,5 | 19,82  | SN152             | 180M/4              | 1475           | 60757         |
| 84,6           | 2025          | 4,0 | 17,44  | SN152             | 180M/4              | 1475           | 58860         |
| 18,0           | 9291          | 0,9 | 81,72  | SN153             | 180M/4              | 1475           | 44784         |
| 20,3           | 8252          | 1,0 | 72,50  | SN153             | 180M/4              | 1475           | 53639         |
| 22,8           | 7366          | 1,1 | 64,64  | SN153             | 180M/4              | 1475           | 59799         |
| 23,7           | 7097          | 1,1 | 62,33  | SN153             | 180M/4              | 1475           | 61486         |
| 27,3           | 6156          | 1,3 | 53,99  | SN153             | 180M/4              | 1475           | 66847         |
| 31,4           | 5365          | 1,5 | 46,99  | SN153             | 180M/4              | 1475           | 70804         |
| 35,2           | 4789          | 1,7 | 41,85  | SN153             | 180M/4              | 1475           | 71691         |
| 39,7           | 4254          | 1,9 | 37,12  | SN153             | 180M/4              | 1475           | 69983         |
| 44,6           | 3798          | 2,1 | 33,10  | SN153             | 180M/4              | 1475           | 68311         |
| 46,2           | 3659          | 2,2 | 31,92  | SN153             | 180M/4              | 1475           | 67776         |
| 53,3           | 3174          | 2,5 | 27,65  | SN153             | 180M/4              | 1475           | 65647         |
| 61,3           | 2766          | 2,9 | 24,06  | SN153             | 180M/4              | 1475           | 63576         |
| 11,5           | 14544         | 0,9 | 128,20 | SN163             | 180M/4              | 1475           | 67406         |
| 12,8           | 13066         | 1,0 | 115,03 | SN163             | 180M/4              | 1475           | 76391         |
| 14,6           | 11467         | 1,1 | 101,03 | SN163             | 180M/4              | 1475           | 84605         |
| 16,8           | 9999          | 1,3 | 87,95  | SN163             | 180M/4              | 1475           | 91103         |
| 19,1           | 8808          | 1,5 | 77,36  | SN163             | 180M/4              | 1475           | 95782         |
| 21,5           | 7822          | 1,7 | 68,62  | SN163             | 180M/4              | 1475           | 99313         |
| 24,1           | 6993          | 1,9 | 61,27  | SN163             | 180M/4              | 1475           | 101922        |
| 26,8           | 6286          | 2,1 | 55,01  | SN163             | 180M/4              | 1475           | 104319        |
| 28,4           | 5931          | 2,2 | 51,94  | SN163             | 180M/4              | 1475           | 105467        |
| 32,5           | 5192          | 2,5 | 45,41  | SN163             | 180M/4              | 1475           | 107447        |
| 36,9           | 4570          | 2,8 | 39,92  | SN163             | 180M/4              | 1475           | 109130        |

## 5.1 SN GEARED MOTORS (50Hz)

| 18,50 kW       |               |     |        |                   |                     |                |               |
|----------------|---------------|-----|--------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i      | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 41,9           | 4040          | 3,2 | 35,24  | SN163             | 180M/4              | 1475           | 110499        |
| 48,4           | 3498          | 3,7 | 30,50  | SN163             | 180M/4              | 1475           | 110047        |
| 8,6            | 19387         | 0,9 | 171,00 | SN183             | 180M/4              | 1475           | 193925        |
| 9,6            | 17464         | 1,0 | 153,87 | SN183             | 180M/4              | 1475           | 190175        |
| 10,8           | 15450         | 1,2 | 136,23 | SN183             | 180M/4              | 1475           | 185696        |
| 12,4           | 13534         | 1,3 | 119,15 | SN183             | 180M/4              | 1475           | 180628        |
| 14,0           | 11980         | 1,5 | 105,33 | SN183             | 180M/4              | 1475           | 175876        |
| 15,7           | 10694         | 1,7 | 93,91  | SN183             | 180M/4              | 1475           | 171410        |
| 17,5           | 9613          | 1,9 | 84,31  | SN183             | 180M/4              | 1475           | 167201        |
| 20,5           | 8197          | 2,2 | 71,87  | SN183             | 180M/4              | 1475           | 160973        |
| 23,3           | 7236          | 2,5 | 63,36  | SN183             | 180M/4              | 1475           | 156087        |
| 26,2           | 6427          | 2,8 | 56,21  | SN183             | 180M/4              | 1475           | 151490        |
| 34,0           | 4972          | 3,6 | 43,38  | SN183             | 180M/4              | 1475           | 141753        |

| 22,00 kW       |               |     |       |                   |                     |                |               |
|----------------|---------------|-----|-------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 56,5           | 3596          | 1,2 | 26,11 | SN142             | 180L/4              | 1475           | 35981         |
| 63,1           | 3220          | 1,3 | 23,36 | SN142             | 180L/4              | 1475           | 38832         |
| 73,0           | 2782          | 1,5 | 20,20 | SN142             | 180L/4              | 1475           | 41759         |
| 84,3           | 2413          | 1,8 | 17,49 | SN142             | 180L/4              | 1475           | 43953         |
| 96,4           | 2113          | 2,0 | 15,30 | SN142             | 180L/4              | 1475           | 45575         |
| 109,4          | 1865          | 2,3 | 13,48 | SN142             | 180L/4              | 1475           | 47008         |
| 123,3          | 1656          | 2,4 | 11,96 | SN142             | 180L/4              | 1475           | 49004         |
| 138,3          | 1478          | 2,6 | 10,67 | SN142             | 180L/4              | 1475           | 49051         |
| 143,4          | 1423          | 2,7 | 10,29 | SN142             | 180L/4              | 1475           | 48614         |
| 165,5          | 1234          | 2,9 | 8,91  | SN142             | 180L/4              | 1475           | 46901         |
| 190,2          | 1075          | 3,1 | 7,75  | SN142             | 180L/4              | 1475           | 45268         |
| 198,1          | 1033          | 2,8 | 7,45  | SN142             | 180L/4              | 1475           | 44556         |
| 223,2          | 917           | 3,0 | 6,61  | SN142             | 180L/4              | 1475           | 43208         |
| 250,4          | 818           | 3,2 | 5,89  | SN142             | 180L/4              | 1475           | 41937         |
| 259,7          | 788           | 3,2 | 5,68  | SN142             | 180L/4              | 1475           | 41539         |
| 299,8          | 684           | 3,5 | 4,92  | SN142             | 180L/4              | 1475           | 39988         |
| 344,4          | 595           | 3,7 | 4,28  | SN142             | 180L/4              | 1475           | 38523         |
| 43,4           | 4635          | 0,9 | 34,02 | SN143             | 180L/4              | 1475           | 25522         |
| 49,1           | 4097          | 1,0 | 30,04 | SN143             | 180L/4              | 1475           | 31539         |
| 64,8           | 3137          | 2,6 | 22,77 | SN152             | 180L/4              | 1475           | 61763         |
| 74,4           | 2735          | 2,9 | 19,82 | SN152             | 180L/4              | 1475           | 59838         |
| 84,6           | 2409          | 3,3 | 17,44 | SN152             | 180L/4              | 1475           | 58055         |

## 5.1 SN GEARED MOTORS (50Hz)

| 22,00 kW                |                        |     |        |                   |                     |                         |                        |
|-------------------------|------------------------|-----|--------|-------------------|---------------------|-------------------------|------------------------|
| n <sub>2</sub><br>[rpm] | M <sub>2</sub><br>[Nm] | sf  | i      | Gear reduc-<br>er | Motor<br>Size/Poles | n <sub>1</sub><br>[rpm] | Fr <sub>2</sub><br>[N] |
| 95,4                    | 2139                   | 3,6 | 15,46  | SN152             | 180L/4              | 1475                    | 56394                  |
| 106,8                   | 1911                   | 3,8 | 13,81  | SN152             | 180L/4              | 1475                    | 54839                  |
| 23,7                    | 8440                   | 0,9 | 62,33  | SN153             | 180L/4              | 1475                    | 52195                  |
| 27,3                    | 7322                   | 1,1 | 53,99  | SN153             | 180L/4              | 1475                    | 60083                  |
| 31,4                    | 6380                   | 1,3 | 46,99  | SN153             | 180L/4              | 1475                    | 65641                  |
| 35,2                    | 5696                   | 1,4 | 41,85  | SN153             | 180L/4              | 1475                    | 69203                  |
| 39,7                    | 5060                   | 1,6 | 37,12  | SN153             | 180L/4              | 1475                    | 68194                  |
| 44,6                    | 4517                   | 1,8 | 33,10  | SN153             | 180L/4              | 1475                    | 66726                  |
| 46,2                    | 4352                   | 1,8 | 31,92  | SN153             | 180L/4              | 1475                    | 66250                  |
| 53,3                    | 3775                   | 2,1 | 27,65  | SN153             | 180L/4              | 1475                    | 64334                  |
| 61,3                    | 3290                   | 2,4 | 24,06  | SN153             | 180L/4              | 1475                    | 62440                  |
| 14,6                    | 13637                  | 1,0 | 101,03 | SN163             | 180L/4              | 1475                    | 73103                  |
| 16,8                    | 11891                  | 1,1 | 87,95  | SN163             | 180L/4              | 1475                    | 82552                  |
| 19,1                    | 10475                  | 1,2 | 77,36  | SN163             | 180L/4              | 1475                    | 89089                  |
| 21,5                    | 9303                   | 1,4 | 68,62  | SN163             | 180L/4              | 1475                    | 93895                  |
| 24,1                    | 8317                   | 1,6 | 61,27  | SN163             | 180L/4              | 1475                    | 97578                  |
| 26,8                    | 7476                   | 1,7 | 55,01  | SN163             | 180L/4              | 1475                    | 100487                 |
| 28,4                    | 7054                   | 1,8 | 51,94  | SN163             | 180L/4              | 1475                    | 101711                 |
| 32,5                    | 6175                   | 2,1 | 45,41  | SN163             | 180L/4              | 1475                    | 104682                 |
| 36,9                    | 5435                   | 2,4 | 39,92  | SN163             | 180L/4              | 1475                    | 106765                 |
| 41,9                    | 4805                   | 2,7 | 35,24  | SN163             | 180L/4              | 1475                    | 108506                 |
| 48,4                    | 4161                   | 3,1 | 30,50  | SN163             | 180L/4              | 1475                    | 108822                 |
| 55,3                    | 3642                   | 3,6 | 26,66  | SN163             | 180L/4              | 1475                    | 105180                 |
| 62,9                    | 3206                   | 4,0 | 23,44  | SN163             | 180L/4              | 1475                    | 101746                 |
| 10,8                    | 18374                  | 1,0 | 136,23 | SN183             | 180L/4              | 1475                    | 180681                 |
| 12,4                    | 16096                  | 1,1 | 119,15 | SN183             | 180L/4              | 1475                    | 176275                 |
| 14,0                    | 14248                  | 1,3 | 105,33 | SN183             | 180L/4              | 1475                    | 172053                 |
| 15,7                    | 12719                  | 1,4 | 93,91  | SN183             | 180L/4              | 1475                    | 168021                 |
| 17,5                    | 11432                  | 1,6 | 84,31  | SN183             | 180L/4              | 1475                    | 164173                 |
| 20,5                    | 9748                   | 1,8 | 71,87  | SN183             | 180L/4              | 1475                    | 158409                 |
| 23,3                    | 8605                   | 2,1 | 63,36  | SN183             | 180L/4              | 1475                    | 153837                 |
| 26,2                    | 7643                   | 2,4 | 56,21  | SN183             | 180L/4              | 1475                    | 149503                 |
| 34,0                    | 5913                   | 3,0 | 43,38  | SN183             | 180L/4              | 1475                    | 140230                 |
| 38,6                    | 5220                   | 3,4 | 38,24  | SN183             | 180L/4              | 1475                    | 135800                 |
| 43,5                    | 4637                   | 3,9 | 33,93  | SN183             | 180L/4              | 1475                    | 131656                 |

## 5.1 SN GEARED MOTORS (50Hz)

| 30,00 kW       |               |     |       |                   |                     |                |               |
|----------------|---------------|-----|-------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 73,0           | 3795          | 1,1 | 20,20 | SN142             | 200L/4              | 1475           | 34319         |
| 84,3           | 3290          | 1,3 | 17,49 | SN142             | 200L/4              | 1475           | 38327         |
| 96,4           | 2881          | 1,5 | 15,30 | SN142             | 200L/4              | 1475           | 41129         |
| 109,4          | 2543          | 1,7 | 13,48 | SN142             | 200L/4              | 1475           | 43495         |
| 123,3          | 2258          | 1,8 | 11,96 | SN142             | 200L/4              | 1475           | 46209         |
| 138,3          | 2015          | 1,9 | 10,67 | SN142             | 200L/4              | 1475           | 47639         |
| 143,4          | 1941          | 2,0 | 10,29 | SN142             | 200L/4              | 1475           | 47254         |
| 165,5          | 1684          | 2,1 | 8,91  | SN142             | 200L/4              | 1475           | 45729         |
| 190,2          | 1467          | 2,3 | 7,75  | SN142             | 200L/4              | 1475           | 44252         |
| 198,1          | 1409          | 2,0 | 7,45  | SN142             | 200L/4              | 1475           | 43485         |
| 223,2          | 1251          | 2,2 | 6,61  | SN142             | 200L/4              | 1475           | 42262         |
| 250,4          | 1117          | 2,3 | 5,89  | SN142             | 200L/4              | 1475           | 41097         |
| 259,7          | 1076          | 2,4 | 5,68  | SN142             | 200L/4              | 1475           | 40729         |
| 299,8          | 933           | 2,5 | 4,92  | SN142             | 200L/4              | 1475           | 39289         |
| 344,4          | 812           | 2,7 | 4,28  | SN142             | 200L/4              | 1475           | 37917         |
| 64,8           | 4278          | 1,9 | 22,77 | SN152             | 200L/4              | 1475           | 59298         |
| 74,4           | 3730          | 2,1 | 19,82 | SN152             | 200L/4              | 1475           | 57706         |
| 84,6           | 3285          | 2,4 | 17,44 | SN152             | 200L/4              | 1475           | 56190         |
| 95,4           | 2917          | 2,6 | 15,46 | SN152             | 200L/4              | 1475           | 54749         |
| 106,8          | 2607          | 2,8 | 13,81 | SN152             | 200L/4              | 1475           | 53376         |
| 119,0          | 2343          | 3,0 | 12,40 | SN152             | 200L/4              | 1475           | 52064         |
| 126,0          | 2210          | 3,1 | 11,71 | SN152             | 200L/4              | 1475           | 51365         |
| 144,1          | 1934          | 3,3 | 10,23 | SN152             | 200L/4              | 1475           | 49733         |
| 163,9          | 1702          | 3,6 | 9,00  | SN152             | 200L/4              | 1475           | 48181         |
| 169,6          | 1645          | 3,2 | 8,70  | SN152             | 200L/4              | 1475           | 47306         |
| 190,0          | 1470          | 3,4 | 7,76  | SN152             | 200L/4              | 1475           | 46012         |
| 211,6          | 1321          | 3,6 | 6,97  | SN152             | 200L/4              | 1475           | 44792         |
| 224,1          | 1246          | 3,7 | 6,58  | SN152             | 200L/4              | 1475           | 44147         |
| 256,3          | 1091          | 4,0 | 5,75  | SN152             | 200L/4              | 1475           | 42653         |
| 291,6          | 960           | 4,0 | 5,06  | SN152             | 200L/4              | 1475           | 41246         |
| 330,3          | 848           | 4,0 | 4,47  | SN152             | 200L/4              | 1475           | 39911         |
| 35,2           | 7768          | 1,0 | 41,85 | SN153             | 200L/4              | 1475           | 57128         |
| 39,7           | 6900          | 1,2 | 37,12 | SN153             | 200L/4              | 1475           | 62675         |
| 44,6           | 6160          | 1,3 | 33,10 | SN153             | 200L/4              | 1475           | 63030         |
| 46,2           | 5935          | 1,3 | 31,92 | SN153             | 200L/4              | 1475           | 62694         |
| 53,3           | 5149          | 1,6 | 27,65 | SN153             | 200L/4              | 1475           | 61279         |
| 61,3           | 4487          | 1,8 | 24,06 | SN153             | 200L/4              | 1475           | 59800         |
| 21,5           | 12687         | 1,0 | 68,62 | SN163             | 200L/4              | 1475           | 78462         |
| 24,1           | 11342         | 1,1 | 61,27 | SN163             | 200L/4              | 1475           | 85191         |

## 5.1 SN GEARED MOTORS (50Hz)

| 30,00 kW       |               |     |       |                   |                     |                |               |
|----------------|---------------|-----|-------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 26,8           | 10195         | 1,3 | 55,01 | SN163             | 200L/4              | 1475           | 90282         |
| 28,4           | 9619          | 1,4 | 51,94 | SN163             | 200L/4              | 1475           | 92646         |
| 32,5           | 8421          | 1,5 | 45,41 | SN163             | 200L/4              | 1475           | 97201         |
| 36,9           | 7413          | 1,8 | 39,92 | SN163             | 200L/4              | 1475           | 100697        |
| 41,9           | 6552          | 2,0 | 35,24 | SN163             | 200L/4              | 1475           | 103433        |
| 48,4           | 5674          | 2,3 | 30,50 | SN163             | 200L/4              | 1475           | 105990        |
| 55,3           | 4968          | 2,6 | 26,66 | SN163             | 200L/4              | 1475           | 102716        |
| 62,9           | 4373          | 3,0 | 23,44 | SN163             | 200L/4              | 1475           | 99587         |
| 83,5           | 3297          | 3,3 | 17,67 | SN163             | 200L/4              | 1475           | 92088         |
| 95,5           | 2886          | 3,7 | 15,45 | SN163             | 200L/4              | 1475           | 89035         |
| 108,6          | 2541          | 4,0 | 13,58 | SN163             | 200L/4              | 1475           | 86150         |
| 15,7           | 17345         | 1,0 | 93,91 | SN183             | 200L/4              | 1475           | 160126        |
| 17,5           | 15590         | 1,2 | 84,31 | SN183             | 200L/4              | 1475           | 157128        |
| 20,5           | 13294         | 1,4 | 71,87 | SN183             | 200L/4              | 1475           | 152454        |
| 23,3           | 11735         | 1,5 | 63,36 | SN183             | 200L/4              | 1475           | 148619        |
| 26,2           | 10424         | 1,7 | 56,21 | SN183             | 200L/4              | 1475           | 144897        |
| 29,4           | 9305          | 1,9 | 50,12 | SN183             | 200L/4              | 1475           | 141287        |
| 34,0           | 8064          | 2,2 | 43,38 | SN183             | 200L/4              | 1475           | 136711        |
| 38,6           | 7119          | 2,5 | 38,24 | SN183             | 200L/4              | 1475           | 132711        |
| 43,5           | 6323          | 2,8 | 33,93 | SN183             | 200L/4              | 1475           | 128926        |
| 56,9           | 4831          | 3,7 | 25,92 | SN183             | 200L/4              | 1475           | 119680        |

| 37,00 kW       |               |     |       |                   |                     |                |               |
|----------------|---------------|-----|-------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 95,4           | 3598          | 2,1 | 15,46 | SN152             | 225S/4              | 1475           | 53286         |
| 106,8          | 3216          | 2,3 | 13,81 | SN152             | 225S/4              | 1475           | 52076         |
| 119,0          | 2890          | 2,4 | 12,40 | SN152             | 225S/4              | 1475           | 50903         |
| 126,0          | 2726          | 2,5 | 11,71 | SN152             | 225S/4              | 1475           | 50272         |
| 144,1          | 2386          | 2,7 | 10,23 | SN152             | 225S/4              | 1475           | 48782         |
| 163,9          | 2099          | 2,9 | 9,00  | SN152             | 225S/4              | 1475           | 47349         |
| 169,6          | 2029          | 2,6 | 8,70  | SN152             | 225S/4              | 1475           | 46387         |
| 190,0          | 1814          | 2,8 | 7,76  | SN152             | 225S/4              | 1475           | 45195         |
| 211,6          | 1630          | 2,9 | 6,97  | SN152             | 225S/4              | 1475           | 44061         |
| 224,1          | 1537          | 3,0 | 6,58  | SN152             | 225S/4              | 1475           | 43458         |
| 256,3          | 1345          | 3,2 | 5,75  | SN152             | 225S/4              | 1475           | 42053         |
| 291,6          | 1184          | 3,4 | 5,06  | SN152             | 225S/4              | 1475           | 40720         |
| 330,3          | 1046          | 3,6 | 4,47  | SN152             | 225S/4              | 1475           | 39449         |
| 44,6           | 7597          | 1,1 | 33,10 | SN153             | 225S/4              | 1475           | 58284         |



## 5.1 SN GEARED MOTORS (50Hz)

| 37,00 kW       |               |     |       |                   |                     |                |               |
|----------------|---------------|-----|-------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 46,2           | 7320          | 1,1 | 31,92 | SN153             | 225S/4              | 1475           | 59505         |
| 53,3           | 6351          | 1,3 | 27,65 | SN153             | 225S/4              | 1475           | 58545         |
| 61,3           | 5534          | 1,4 | 24,06 | SN153             | 225S/4              | 1475           | 57443         |
| 70,7           | 4800          | 1,2 | 20,87 | SN153             | 225S/4              | 1475           | 54829         |
| 79,3           | 4285          | 1,3 | 18,61 | SN153             | 225S/4              | 1475           | 53888         |
| 82,2           | 4128          | 1,3 | 17,95 | SN153             | 225S/4              | 1475           | 53573         |
| 105,2          | 3265          | 3,4 | 14,02 | SN162             | 225S/4              | 1475           | 86316         |
| 119,3          | 2881          | 3,7 | 12,36 | SN162             | 225S/4              | 1475           | 83594         |
| 134,5          | 2558          | 4,0 | 10,97 | SN162             | 225S/4              | 1475           | 81048         |
| 150,9          | 2283          | 4,0 | 9,78  | SN162             | 225S/4              | 1475           | 78649         |
| 26,8           | 12575         | 1,0 | 55,01 | SN163             | 225S/4              | 1475           | 79060         |
| 28,4           | 11865         | 1,1 | 51,94 | SN163             | 225S/4              | 1475           | 82684         |
| 32,5           | 10387         | 1,3 | 45,41 | SN163             | 225S/4              | 1475           | 89469         |
| 36,9           | 9143          | 1,4 | 39,92 | SN163             | 225S/4              | 1475           | 94513         |
| 41,9           | 8082          | 1,6 | 35,24 | SN163             | 225S/4              | 1475           | 98411         |
| 48,4           | 6999          | 1,9 | 30,50 | SN163             | 225S/4              | 1475           | 101903        |
| 55,3           | 6127          | 2,1 | 26,66 | SN163             | 225S/4              | 1475           | 100531        |
| 62,9           | 5394          | 2,4 | 23,44 | SN163             | 225S/4              | 1475           | 97677         |
| 83,5           | 4067          | 2,7 | 17,67 | SN163             | 225S/4              | 1475           | 90478         |
| 95,5           | 3560          | 3,0 | 15,45 | SN163             | 225S/4              | 1475           | 87634         |
| 108,6          | 3134          | 3,2 | 13,58 | SN163             | 225S/4              | 1475           | 84923         |
| 20,5           | 16397         | 1,1 | 71,87 | SN183             | 225S/4              | 1475           | 147136        |
| 23,3           | 14474         | 1,2 | 63,36 | SN183             | 225S/4              | 1475           | 143967        |
| 26,2           | 12857         | 1,4 | 56,21 | SN183             | 225S/4              | 1475           | 140798        |
| 29,4           | 11477         | 1,6 | 50,12 | SN183             | 225S/4              | 1475           | 137653        |
| 34,0           | 9946          | 1,8 | 43,38 | SN183             | 225S/4              | 1475           | 133587        |
| 38,6           | 8780          | 2,1 | 38,24 | SN183             | 225S/4              | 1475           | 129972        |
| 43,5           | 7799          | 2,3 | 33,93 | SN183             | 225S/4              | 1475           | 126508        |
| 56,9           | 5959          | 3,0 | 25,92 | SN183             | 225S/4              | 1475           | 117636        |
| 64,6           | 5261          | 3,3 | 22,85 | SN183             | 225S/4              | 1475           | 114147        |
| 72,8           | 4673          | 3,6 | 20,27 | SN183             | 225S/4              | 1475           | 110852        |

| 45,00 kW       |               |     |       |                   |                     |                |               |
|----------------|---------------|-----|-------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 95,4           | 4376          | 1,8 | 15,46 | SN152             | 225M/4              | 1475           | 51587         |
| 106,8          | 3911          | 1,9 | 13,81 | SN152             | 225M/4              | 1475           | 50569         |
| 119,0          | 3515          | 2,0 | 12,40 | SN152             | 225M/4              | 1475           | 49558         |
| 126,0          | 3316          | 2,1 | 11,71 | SN152             | 225M/4              | 1475           | 49005         |

## 5.1 SN GEARED MOTORS (50Hz)

| 45,00 kW       |               |     |       |                   |                     |                |               |
|----------------|---------------|-----|-------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 144,1          | 2902          | 2,2 | 10,23 | SN152             | 225M/4              | 1475           | 47682         |
| 163,9          | 2554          | 2,4 | 9,00  | SN152             | 225M/4              | 1475           | 46388         |
| 169,6          | 2468          | 2,1 | 8,70  | SN152             | 225M/4              | 1475           | 45324         |
| 190,0          | 2206          | 2,3 | 7,76  | SN152             | 225M/4              | 1475           | 44251         |
| 211,6          | 1983          | 2,4 | 6,97  | SN152             | 225M/4              | 1475           | 43217         |
| 224,1          | 1870          | 2,5 | 6,58  | SN152             | 225M/4              | 1475           | 42663         |
| 256,3          | 1637          | 2,7 | 5,75  | SN152             | 225M/4              | 1475           | 41361         |
| 291,6          | 1440          | 2,8 | 5,06  | SN152             | 225M/4              | 1475           | 40115         |
| 330,3          | 1272          | 3,0 | 4,47  | SN152             | 225M/4              | 1475           | 38916         |
| 53,3           | 7724          | 1,0 | 27,65 | SN153             | 225M/4              | 1475           | 55351         |
| 61,3           | 6732          | 1,2 | 24,06 | SN153             | 225M/4              | 1475           | 54694         |
| 70,7           | 5838          | 1,0 | 20,87 | SN153             | 225M/4              | 1475           | 52130         |
| 79,3           | 5212          | 1,1 | 18,61 | SN153             | 225M/4              | 1475           | 51504         |
| 82,2           | 5022          | 1,1 | 17,95 | SN153             | 225M/4              | 1475           | 51281         |
| 105,2          | 3971          | 2,8 | 14,02 | SN162             | 225M/4              | 1475           | 85020         |
| 119,3          | 3504          | 3,0 | 12,36 | SN162             | 225M/4              | 1475           | 82456         |
| 134,5          | 3112          | 3,3 | 10,97 | SN162             | 225M/4              | 1475           | 80041         |
| 150,9          | 2777          | 3,5 | 9,78  | SN162             | 225M/4              | 1475           | 77754         |
| 168,5          | 2488          | 3,7 | 8,75  | SN162             | 225M/4              | 1475           | 75576         |
| 181,6          | 2307          | 3,4 | 8,12  | SN162             | 225M/4              | 1475           | 73621         |
| 206,0          | 2036          | 3,7 | 7,16  | SN162             | 225M/4              | 1475           | 71268         |
| 232,2          | 1808          | 3,9 | 6,35  | SN162             | 225M/4              | 1475           | 69071         |
| 260,4          | 1613          | 4,0 | 5,66  | SN162             | 225M/4              | 1475           | 67004         |
| 32,5           | 12633         | 1,0 | 45,41 | SN163             | 225M/4              | 1475           | 78748         |
| 36,9           | 11121         | 1,2 | 39,92 | SN163             | 225M/4              | 1475           | 86217         |
| 41,9           | 9830          | 1,3 | 35,24 | SN163             | 225M/4              | 1475           | 91795         |
| 48,4           | 8512          | 1,5 | 30,50 | SN163             | 225M/4              | 1475           | 96872         |
| 55,3           | 7453          | 1,7 | 26,66 | SN163             | 225M/4              | 1475           | 98003         |
| 62,9           | 6560          | 2,0 | 23,44 | SN163             | 225M/4              | 1475           | 95467         |
| 83,5           | 4946          | 2,2 | 17,67 | SN163             | 225M/4              | 1475           | 88617         |
| 95,5           | 4331          | 2,4 | 15,45 | SN163             | 225M/4              | 1475           | 86016         |
| 108,6          | 3812          | 2,7 | 13,58 | SN163             | 225M/4              | 1475           | 83508         |
| 88,6           | 4713          | 3,8 | 16,64 | SN182             | 225M/4              | 1475           | 104840        |
| 23,3           | 17605         | 1,0 | 63,36 | SN183             | 225M/4              | 1475           | 138551        |
| 26,2           | 15638         | 1,2 | 56,21 | SN183             | 225M/4              | 1475           | 136032        |
| 29,4           | 13959         | 1,3 | 50,12 | SN183             | 225M/4              | 1475           | 133434        |
| 34,0           | 12097         | 1,5 | 43,38 | SN183             | 225M/4              | 1475           | 129965        |
| 38,6           | 10680         | 1,7 | 38,24 | SN183             | 225M/4              | 1475           | 126800        |
| 43,5           | 9487          | 1,9 | 33,93 | SN183             | 225M/4              | 1475           | 123710        |

## 5.1 SN GEARED MOTORS (50Hz)

| 45,00 kW       |               |     |       |                   |                     |                |               |
|----------------|---------------|-----|-------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 144,1          | 2902          | 2,2 | 10,23 | SN152             | 225M/4              | 1475           | 47682         |
| 163,9          | 2554          | 2,4 | 9,00  | SN152             | 225M/4              | 1475           | 46388         |
| 169,6          | 2468          | 2,1 | 8,70  | SN152             | 225M/4              | 1475           | 45324         |
| 190,0          | 2206          | 2,3 | 7,76  | SN152             | 225M/4              | 1475           | 44251         |
| 211,6          | 1983          | 2,4 | 6,97  | SN152             | 225M/4              | 1475           | 43217         |
| 224,1          | 1870          | 2,5 | 6,58  | SN152             | 225M/4              | 1475           | 42663         |
| 256,3          | 1637          | 2,7 | 5,75  | SN152             | 225M/4              | 1475           | 41361         |
| 291,6          | 1440          | 2,8 | 5,06  | SN152             | 225M/4              | 1475           | 40115         |
| 330,3          | 1272          | 3,0 | 4,47  | SN152             | 225M/4              | 1475           | 38916         |
| 53,3           | 7724          | 1,0 | 27,65 | SN153             | 225M/4              | 1475           | 55351         |
| 61,3           | 6732          | 1,2 | 24,06 | SN153             | 225M/4              | 1475           | 54694         |
| 70,7           | 5838          | 1,0 | 20,87 | SN153             | 225M/4              | 1475           | 52130         |
| 79,3           | 5212          | 1,1 | 18,61 | SN153             | 225M/4              | 1475           | 51504         |
| 82,2           | 5022          | 1,1 | 17,95 | SN153             | 225M/4              | 1475           | 51281         |
| 105,2          | 3971          | 2,8 | 14,02 | SN162             | 225M/4              | 1475           | 85020         |
| 119,3          | 3504          | 3,0 | 12,36 | SN162             | 225M/4              | 1475           | 82456         |
| 134,5          | 3112          | 3,3 | 10,97 | SN162             | 225M/4              | 1475           | 80041         |
| 150,9          | 2777          | 3,5 | 9,78  | SN162             | 225M/4              | 1475           | 77754         |
| 168,5          | 2488          | 3,7 | 8,75  | SN162             | 225M/4              | 1475           | 75576         |
| 181,6          | 2307          | 3,4 | 8,12  | SN162             | 225M/4              | 1475           | 73621         |
| 206,0          | 2036          | 3,7 | 7,16  | SN162             | 225M/4              | 1475           | 71268         |
| 232,2          | 1808          | 3,9 | 6,35  | SN162             | 225M/4              | 1475           | 69071         |
| 260,4          | 1613          | 4,0 | 5,66  | SN162             | 225M/4              | 1475           | 67004         |
| 32,5           | 12633         | 1,0 | 45,41 | SN163             | 225M/4              | 1475           | 78748         |
| 36,9           | 11121         | 1,2 | 39,92 | SN163             | 225M/4              | 1475           | 86217         |
| 41,9           | 9830          | 1,3 | 35,24 | SN163             | 225M/4              | 1475           | 91795         |
| 48,4           | 8512          | 1,5 | 30,50 | SN163             | 225M/4              | 1475           | 96872         |
| 55,3           | 7453          | 1,7 | 26,66 | SN163             | 225M/4              | 1475           | 98003         |
| 62,9           | 6560          | 2,0 | 23,44 | SN163             | 225M/4              | 1475           | 95467         |
| 83,5           | 4946          | 2,2 | 17,67 | SN163             | 225M/4              | 1475           | 88617         |
| 95,5           | 4331          | 2,4 | 15,45 | SN163             | 225M/4              | 1475           | 86016         |
| 108,6          | 3812          | 2,7 | 13,58 | SN163             | 225M/4              | 1475           | 83508         |
| 88,6           | 4713          | 3,8 | 16,64 | SN182             | 225M/4              | 1475           | 104840        |
| 23,3           | 17605         | 1,0 | 63,36 | SN183             | 225M/4              | 1475           | 138551        |
| 26,2           | 15638         | 1,2 | 56,21 | SN183             | 225M/4              | 1475           | 136032        |
| 29,4           | 13959         | 1,3 | 50,12 | SN183             | 225M/4              | 1475           | 133434        |
| 34,0           | 12097         | 1,5 | 43,38 | SN183             | 225M/4              | 1475           | 129965        |
| 38,6           | 10680         | 1,7 | 38,24 | SN183             | 225M/4              | 1475           | 126800        |
| 43,5           | 9487          | 1,9 | 33,93 | SN183             | 225M/4              | 1475           | 123710        |

## 5.1 SN GEARED MOTORS (50Hz)

| 45,00 kW       |               |     |       |              |                  |                |               |
|----------------|---------------|-----|-------|--------------|------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reducer | Motor Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 56,9           | 7248          | 2,5 | 25,92 | SN183        | 225M/4           | 1475           | 115272        |
| 64,6           | 6399          | 2,7 | 22,85 | SN183        | 225M/4           | 1475           | 112074        |
| 72,8           | 5684          | 3,0 | 20,27 | SN183        | 225M/4           | 1475           | 109022        |

| 55,00 kW       |               |     |       |              |                  |                |               |
|----------------|---------------|-----|-------|--------------|------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reducer | Motor Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 105,5          | 4837          | 2,3 | 14,02 | SN162        | 250M/4           | 1480           | 83320         |
| 119,7          | 4269          | 2,5 | 12,36 | SN162        | 250M/4           | 1480           | 80956         |
| 135,0          | 3791          | 2,7 | 10,97 | SN162        | 250M/4           | 1480           | 78708         |
| 151,4          | 3383          | 2,8 | 9,78  | SN162        | 250M/4           | 1480           | 76563         |
| 169,1          | 3031          | 3,0 | 8,75  | SN162        | 250M/4           | 1480           | 74507         |
| 182,2          | 2811          | 2,8 | 8,12  | SN162        | 250M/4           | 1480           | 72511         |
| 206,7          | 2481          | 3,0 | 7,16  | SN162        | 250M/4           | 1480           | 70287         |
| 233,0          | 2203          | 3,2 | 6,35  | SN162        | 250M/4           | 1480           | 68197         |
| 261,3          | 1965          | 3,4 | 5,66  | SN162        | 250M/4           | 1480           | 66221         |
| 42,0           | 11974         | 1,1 | 35,24 | SN163        | 250M/4           | 1480           | 82139         |
| 48,5           | 10369         | 1,3 | 30,50 | SN163        | 250M/4           | 1480           | 89541         |
| 55,5           | 9078          | 1,4 | 26,66 | SN163        | 250M/4           | 1480           | 94741         |
| 63,1           | 7992          | 1,6 | 23,44 | SN163        | 250M/4           | 1480           | 92610         |
| 83,8           | 6025          | 1,8 | 17,67 | SN163        | 250M/4           | 1480           | 86202         |
| 95,8           | 5275          | 2,0 | 15,45 | SN163        | 250M/4           | 1480           | 83909         |
| 109,0          | 4644          | 2,2 | 13,58 | SN163        | 250M/4           | 1480           | 81659         |
| 88,9           | 5742          | 3,1 | 16,64 | SN182        | 250M/4           | 1480           | 103071        |
| 100,2          | 5100          | 3,5 | 14,77 | SN182        | 250M/4           | 1480           | 100154        |
| 112,2          | 4560          | 3,9 | 13,19 | SN182        | 250M/4           | 1480           | 97419         |
| 124,9          | 4100          | 4,0 | 11,85 | SN182        | 250M/4           | 1480           | 94841         |
| 29,5           | 17004         | 1,1 | 50,12 | SN183        | 250M/4           | 1480           | 128000        |
| 34,1           | 14736         | 1,2 | 43,38 | SN183        | 250M/4           | 1480           | 125293        |
| 38,7           | 13009         | 1,4 | 38,24 | SN183        | 250M/4           | 1480           | 122701        |
| 43,6           | 11556         | 1,6 | 33,93 | SN183        | 250M/4           | 1480           | 120086        |
| 57,1           | 8829          | 2,0 | 25,92 | SN183        | 250M/4           | 1480           | 112199        |
| 64,8           | 7795          | 2,2 | 22,85 | SN183        | 250M/4           | 1480           | 109372        |
| 73,0           | 6924          | 2,4 | 20,27 | SN183        | 250M/4           | 1480           | 106629        |

| 75,00 kW       |               |     |       |              |                  |                |               |
|----------------|---------------|-----|-------|--------------|------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reducer | Motor Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 105,9          | 6575          | 1,7 | 14,02 | SN162        | 280S/4           | 1485           | 79954         |
| 120,1          | 5803          | 1,8 | 12,36 | SN162        | 280S/4           | 1485           | 77998         |

## 5.1 SN GEARED MOTORS (50Hz)

| 75,00 kW       |               |     |       |                   |                     |                |               |
|----------------|---------------|-----|-------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 135,4          | 5153          | 2,0 | 10,97 | SN162             | 280S/4              | 1485           | 76090         |
| 151,9          | 4598          | 2,1 | 9,78  | SN162             | 280S/4              | 1485           | 74232         |
| 169,7          | 4120          | 2,2 | 8,75  | SN162             | 280S/4              | 1485           | 72422         |
| 182,8          | 3821          | 2,1 | 8,12  | SN162             | 280S/4              | 1485           | 70338         |
| 207,4          | 3372          | 2,2 | 7,16  | SN162             | 280S/4              | 1485           | 68373         |
| 233,8          | 2994          | 2,4 | 6,35  | SN162             | 280S/4              | 1485           | 66500         |
| 262,2          | 2672          | 2,5 | 5,66  | SN162             | 280S/4              | 1485           | 64709         |
| 55,7           | 12339         | 1,1 | 26,66 | SN163             | 280S/4              | 1485           | 80292         |
| 63,4           | 10862         | 1,2 | 23,44 | SN163             | 280S/4              | 1485           | 86865         |
| 84,0           | 8190          | 1,3 | 17,67 | SN163             | 280S/4              | 1485           | 81356         |
| 96,1           | 7170          | 1,5 | 15,45 | SN163             | 280S/4              | 1485           | 79700         |
| 109,4          | 6312          | 1,6 | 13,58 | SN163             | 280S/4              | 1485           | 77978         |
| 89,2           | 7804          | 2,3 | 16,64 | SN182             | 280S/4              | 1485           | 99589         |
| 100,5          | 6932          | 2,6 | 14,77 | SN182             | 280S/4              | 1485           | 97071         |
| 112,6          | 6198          | 2,9 | 13,19 | SN182             | 280S/4              | 1485           | 94669         |
| 125,3          | 5573          | 3,2 | 11,85 | SN182             | 280S/4              | 1485           | 92373         |
| 149,3          | 4677          | 3,2 | 9,94  | SN182             | 280S/4              | 1485           | 87788         |
| 168,3          | 4154          | 3,4 | 8,82  | SN182             | 280S/4              | 1485           | 85342         |
| 188,4          | 3714          | 3,6 | 7,88  | SN182             | 280S/4              | 1485           | 83043         |
| 209,7          | 3339          | 3,9 | 7,08  | SN182             | 280S/4              | 1485           | 80872         |
| 38,8           | 17681         | 1,0 | 38,24 | SN183             | 280S/4              | 1485           | 114422        |
| 43,8           | 15706         | 1,1 | 33,93 | SN183             | 280S/4              | 1485           | 112795        |
| 57,3           | 12000         | 1,5 | 25,92 | SN183             | 280S/4              | 1485           | 106031        |
| 65,0           | 10595         | 1,6 | 22,85 | SN183             | 280S/4              | 1485           | 103969        |
| 73,3           | 9411          | 1,8 | 20,27 | SN183             | 280S/4              | 1485           | 101861        |

| 90,00 kW       |               |     |       |                   |                     |                |               |
|----------------|---------------|-----|-------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 105,9          | 7891          | 1,4 | 14,02 | SN162             | 280M/4              | 1485           | 77431         |
| 120,1          | 6964          | 1,5 | 12,36 | SN162             | 280M/4              | 1485           | 75790         |
| 135,4          | 6184          | 1,6 | 10,97 | SN162             | 280M/4              | 1485           | 74144         |
| 151,9          | 5518          | 1,7 | 9,78  | SN162             | 280M/4              | 1485           | 72507         |
| 169,7          | 4944          | 1,8 | 8,75  | SN162             | 280M/4              | 1485           | 70885         |
| 182,8          | 4585          | 1,7 | 8,12  | SN162             | 280M/4              | 1485           | 68728         |
| 207,4          | 4047          | 1,8 | 7,16  | SN162             | 280M/4              | 1485           | 66962         |
| 233,8          | 3593          | 2,0 | 6,35  | SN162             | 280M/4              | 1485           | 65255         |
| 262,2          | 3206          | 2,1 | 5,66  | SN162             | 280M/4              | 1485           | 63604         |
| 96,1           | 8605          | 1,2 | 15,45 | SN163             | 280M/4              | 1485           | 76513         |

## 5.1 SN GEARED MOTORS (50Hz)

| 90,00 kW       |               |     |       |                   |                     |                |               |
|----------------|---------------|-----|-------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 109,4          | 7575          | 1,3 | 13,58 | SN163             | 280M/4              | 1485           | 75203         |
| 89,2           | 9365          | 1,9 | 16,64 | SN182             | 280M/4              | 1485           | 96996         |
| 100,5          | 8319          | 2,2 | 14,77 | SN182             | 280M/4              | 1485           | 94785         |
| 112,6          | 7439          | 2,4 | 13,19 | SN182             | 280M/4              | 1485           | 92638         |
| 125,3          | 6688          | 2,7 | 11,85 | SN182             | 280M/4              | 1485           | 90558         |
| 149,3          | 5612          | 2,7 | 9,94  | SN182             | 280M/4              | 1485           | 86096         |
| 168,3          | 4985          | 2,8 | 8,82  | SN182             | 280M/4              | 1485           | 83848         |
| 188,4          | 4457          | 3,0 | 7,88  | SN182             | 280M/4              | 1485           | 81715         |
| 209,7          | 4007          | 3,2 | 7,08  | SN182             | 280M/4              | 1485           | 79684         |
| 57,3           | 14401         | 1,2 | 25,92 | SN183             | 280M/4              | 1485           | 101336        |
| 65,0           | 12714         | 1,4 | 22,85 | SN183             | 280M/4              | 1485           | 99874         |
| 73,3           | 11294         | 1,5 | 20,27 | SN183             | 280M/4              | 1485           | 98262         |

| 110,00 kW      |               |     |       |                   |                     |                |               |
|----------------|---------------|-----|-------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 89,3           | 11431         | 1,6 | 16,64 | SN182             | 315S/4              | 1487           | 93460         |
| 100,7          | 10154         | 1,8 | 14,77 | SN182             | 315S/4              | 1487           | 91668         |
| 112,7          | 9079          | 2,0 | 13,19 | SN182             | 315S/4              | 1487           | 89869         |
| 125,5          | 8163          | 2,2 | 11,85 | SN182             | 315S/4              | 1487           | 88082         |
| 149,5          | 6850          | 2,2 | 9,94  | SN182             | 315S/4              | 1487           | 83786         |
| 168,5          | 6085          | 2,3 | 8,82  | SN182             | 315S/4              | 1487           | 81809         |
| 188,6          | 5441          | 2,5 | 7,88  | SN182             | 315S/4              | 1487           | 79900         |
| 210,0          | 4891          | 2,6 | 7,08  | SN182             | 315S/4              | 1487           | 78059         |
| 57,4           | 17577         | 1,0 | 25,92 | SN183             | 315S/4              | 1487           | 94903         |
| 65,1           | 15518         | 1,1 | 22,85 | SN183             | 315S/4              | 1487           | 94271         |
| 73,4           | 13786         | 1,2 | 20,27 | SN183             | 315S/4              | 1487           | 93342         |

| 132,00 kW      |               |     |       |                   |                     |                |               |
|----------------|---------------|-----|-------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 89,3           | 13718         | 1,3 | 16,64 | SN182             | 315M/4a             | 1487           | 89520         |
| 100,7          | 12185         | 1,5 | 14,77 | SN182             | 315M/4a             | 1487           | 88203         |
| 112,7          | 10896         | 1,7 | 13,19 | SN182             | 315M/4a             | 1487           | 86799         |
| 125,5          | 9796          | 1,8 | 11,85 | SN182             | 315M/4a             | 1487           | 85343         |
| 149,5          | 8221          | 1,8 | 9,94  | SN182             | 315M/4a             | 1487           | 81230         |
| 168,5          | 7302          | 1,9 | 8,82  | SN182             | 315M/4a             | 1487           | 79558         |
| 188,6          | 6529          | 2,1 | 7,88  | SN182             | 315M/4a             | 1487           | 77903         |
| 210,0          | 5870          | 2,2 | 7,08  | SN182             | 315M/4a             | 1487           | 76276         |

## 5.1 SN GEARED MOTORS (50Hz)

| 132,00 kW      |               |     |       |                   |                     |                |               |
|----------------|---------------|-----|-------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 65,1           | 18623         | 0,9 | 22,85 | SN183             | 315M/4a             | 1487           | 87944         |
| 73,4           | 16543         | 1,0 | 20,27 | SN183             | 315M/4a             | 1487           | 87804         |

| 160,00 kW      |               |     |       |                   |                     |                |               |
|----------------|---------------|-----|-------|-------------------|---------------------|----------------|---------------|
| $n_2$<br>[rpm] | $M_2$<br>[Nm] | sf  | i     | Gear reduc-<br>er | Motor<br>Size/Poles | $n_1$<br>[rpm] | $Fr_2$<br>[N] |
| 89,4           | 16617         | 1,1 | 16,64 | SN182             | 315M/4b             | 1488           | 84381         |
| 100,8          | 14761         | 1,2 | 14,77 | SN182             | 315M/4b             | 1488           | 83692         |
| 112,8          | 13199         | 1,4 | 13,19 | SN182             | 315M/4b             | 1488           | 82805         |
| 125,6          | 11866         | 1,5 | 11,85 | SN182             | 315M/4b             | 1488           | 81785         |
| 149,6          | 9959          | 1,5 | 9,94  | SN182             | 315M/4b             | 1488           | 77906         |
| 168,6          | 8846          | 1,6 | 8,82  | SN182             | 315M/4b             | 1488           | 76634         |
| 188,8          | 7910          | 1,7 | 7,88  | SN182             | 315M/4b             | 1488           | 75310         |
| 210,2          | 7111          | 1,8 | 7,08  | SN182             | 315M/4b             | 1488           | 73962         |

## 5.2 ISN GEAR REDUCER - 2900 rpm

| ISN142                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 2200                    | 4,28  | -                       | 339                     | -                      | 31593                  |
| 2370                    | 4,92  | -                       | 295                     | -                      | 32632                  |
| 2550                    | 5,68  | -                       | 255                     | -                      | 33765                  |
| 2580                    | 5,89  | -                       | 246                     | -                      | 34127                  |
| 2730                    | 6,61  | -                       | 219                     | -                      | 35083                  |
| 2880                    | 7,45  | -                       | 195                     | -                      | 36165                  |
| 3300                    | 7,75  | -                       | 187                     | -                      | 36215                  |
| 3540                    | 8,91  | -                       | 163                     | -                      | 37392                  |
| 3790                    | 10,29 | -                       | 141                     | -                      | 38694                  |
| 3830                    | 10,67 | -                       | 136                     | -                      | 38291                  |
| 4030                    | 11,96 | -                       | 121                     | -                      | 35135                  |
| 4250                    | 13,48 | -                       | 108                     | -                      | 31078                  |
| 4300                    | 15,30 | -                       | 95                      | -                      | 29600                  |
| 4300                    | 17,49 | -                       | 83                      | -                      | 29600                  |
| 4300                    | 20,20 | 63                      | 72                      | -                      | 29600                  |
| 4300                    | 23,36 | 57                      | 62                      | -                      | 29600                  |
| 4300                    | 26,11 | 52                      | 56                      | -                      | 29600                  |

| ISN143                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 4300                    | 30,04  | -                       | 48                      | 370                    | 29600                  |
| 4300                    | 34,02  | -                       | 43                      | 849                    | 29600                  |
| 4300                    | 38,70  | -                       | 37                      | 1284                   | 29600                  |
| 4300                    | 44,27  | -                       | 33                      | 1681                   | 29600                  |
| 4300                    | 51,01  | -                       | 28                      | 2043                   | 29600                  |
| 4300                    | 59,34  | 23                      | 24                      | 2374                   | 29600                  |
| 4300                    | 60,82  | -                       | 24                      | 3134                   | 29600                  |
| 4300                    | 69,18  | -                       | 21                      | 3197                   | 29600                  |
| 4300                    | 79,14  | -                       | 18                      | 3254                   | 29600                  |
| 4300                    | 91,19  | -                       | 16                      | 3305                   | 29600                  |
| 4300                    | 106,08 | 13                      | 14                      | 3353                   | 29600                  |
| 4300                    | 124,53 | 11                      | 12                      | 3414                   | 29600                  |
| 4300                    | 139,76 | 10                      | 10                      | 3440                   | 29600                  |
| 4300                    | 167,96 | 8                       | 9                       | 3473                   | 29600                  |
| 4300                    | 197,01 | 7                       | 7                       | 3499                   | 29600                  |
| 4300                    | 221,47 | 6                       | 7                       | 3515                   | 29600                  |



## 5.2 ISN GEAR REDUCER - 2900 rpm

| ISN152                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 3800                    | 4,47  | -                       | 325                     | -                      | 30034                  |
| 4080                    | 5,06  | -                       | 287                     | -                      | 30748                  |
| 4350                    | 5,75  | -                       | 252                     | -                      | 31612                  |
| 4630                    | 6,58  | -                       | 220                     | -                      | 32592                  |
| 4770                    | 6,97  | -                       | 208                     | -                      | 32969                  |
| 5010                    | 7,76  | -                       | 187                     | -                      | 33787                  |
| 5260                    | 8,70  | -                       | 167                     | -                      | 34710                  |
| 6050                    | 9,00  | -                       | 161                     | -                      | 34844                  |
| 6420                    | 10,23 | -                       | 142                     | -                      | 35845                  |
| 6820                    | 11,71 | -                       | 124                     | -                      | 36936                  |
| 7000                    | 12,40 | -                       | 117                     | -                      | 37404                  |
| 7330                    | 13,81 | -                       | 105                     | -                      | 38349                  |
| 7680                    | 15,46 | -                       | 94                      | -                      | 39400                  |
| 8000                    | 17,44 | -                       | 83                      | -                      | 40735                  |
| 8000                    | 19,82 | -                       | 73                      | -                      | 43221                  |
| 8000                    | 22,77 | 100                     | 64                      | -                      | 46018                  |

| ISN153                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 5560                    | 17,95  | -                       | 81                      | -                      | 46247                  |
| 5620                    | 18,61  | -                       | 78                      | -                      | 46758                  |
| 5820                    | 20,87  | -                       | 69                      | -                      | 48384                  |
| 8000                    | 24,06  | -                       | 60                      | -                      | 47165                  |
| 8000                    | 27,65  | -                       | 52                      | -                      | 50137                  |
| 8000                    | 31,92  | -                       | 45                      | -                      | 53342                  |
| 8000                    | 33,10  | -                       | 44                      | -                      | 54175                  |
| 8000                    | 37,12  | -                       | 39                      | -                      | 55500                  |
| 8000                    | 41,85  | -                       | 35                      | -                      | 55500                  |
| 8000                    | 46,99  | -                       | 31                      | 2038                   | 55500                  |
| 8000                    | 53,99  | -                       | 27                      | 2582                   | 55500                  |
| 8000                    | 62,33  | -                       | 23                      | 3029                   | 55500                  |
| 8000                    | 64,64  | -                       | 22                      | 3039                   | 55500                  |
| 8000                    | 72,50  | -                       | 20                      | 3122                   | 55500                  |
| 8000                    | 81,72  | -                       | 18                      | 3199                   | 55500                  |
| 8000                    | 92,70  | -                       | 16                      | 3270                   | 55500                  |
| 8000                    | 105,99 | -                       | 14                      | 3335                   | 55500                  |
| 8000                    | 122,41 | 21                      | 12                      | 3396                   | 55500                  |
| 8000                    | 141,55 | 18                      | 10                      | 3469                   | 55500                  |

## 5.2 ISN GEAR REDUCER - 2900 rpm

| ISN153                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 8000                    | 158,23 | 16                      | 9                       | 3504                   | 55500                  |
| 8000                    | 190,20 | 13                      | 8                       | 3555                   | 55500                  |
| 8000                    | 222,16 | 11                      | 7                       | 3590                   | 55500                  |

| ISN162                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 6660                    | 5,66  | -                       | 256                     | -                      | 24062                  |
| 7040                    | 6,35  | -                       | 228                     | -                      | 28406                  |
| 7440                    | 7,16  | -                       | 202                     | -                      | 33157                  |
| 7870                    | 8,12  | -                       | 179                     | -                      | 38380                  |
| 9130                    | 8,75  | -                       | 166                     | -                      | 41694                  |
| 9610                    | 9,78  | -                       | 148                     | -                      | 46426                  |
| 10120                   | 10,97 | -                       | 132                     | -                      | 51518                  |
| 10660                   | 12,36 | -                       | 117                     | -                      | 57074                  |
| 11250                   | 14,02 | -                       | 103                     | -                      | 63142                  |

| ISN163                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 10150                   | 13,58  | -                       | 107                     | -                      | 60141                  |
| 10550                   | 15,45  | -                       | 94                      | -                      | 66375                  |
| 11000                   | 17,67  | -                       | 82                      | -                      | 69064                  |
| 13000                   | 23,44  | -                       | 62                      | -                      | 76000                  |
| 13000                   | 26,66  | -                       | 54                      | -                      | 76000                  |
| 13000                   | 30,50  | -                       | 48                      | -                      | 76000                  |
| 13000                   | 35,24  | -                       | 41                      | -                      | 76000                  |
| 13000                   | 39,92  | -                       | 36                      | 1134                   | 76000                  |
| 13000                   | 45,41  | -                       | 32                      | 1938                   | 76000                  |
| 13000                   | 51,94  | -                       | 28                      | 2678                   | 76000                  |
| 13000                   | 55,01  | -                       | 26                      | 3038                   | 76000                  |
| 13000                   | 61,27  | -                       | 24                      | 3530                   | 76000                  |
| 13000                   | 68,62  | -                       | 21                      | 3992                   | 76000                  |
| 13000                   | 77,36  | -                       | 19                      | 4424                   | 76000                  |
| 13000                   | 87,95  | -                       | 16                      | 4829                   | 76000                  |
| 13000                   | 101,03 | 40                      | 14                      | 5085                   | 76000                  |
| 13000                   | 115,03 | 35                      | 13                      | 5167                   | 76000                  |
| 13000                   | 128,20 | 32                      | 11                      | 5218                   | 76000                  |

## 5.2 ISN GEAR REDUCER - 2900 rpm

| ISN182                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 12860                   | 7,08  | -                       | 205                     | -                      | 56290                  |
| 13490                   | 7,88  | -                       | 184                     | -                      | 57625                  |
| 14170                   | 8,82  | -                       | 164                     | -                      | 59086                  |
| 14900                   | 9,94  | -                       | 146                     | -                      | 60730                  |
| 17920                   | 11,85 | -                       | 122                     | -                      | 63010                  |
| 18000                   | 13,19 | -                       | 110                     | -                      | 66171                  |
| 18000                   | 14,77 | -                       | 98                      | -                      | 69795                  |
| 18000                   | 16,64 | -                       | 87                      | -                      | 73773                  |

| ISN183                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 16800                   | 20,27  | -                       | 72                      | 19858                  | 79179                  |
| 17400                   | 22,85  | -                       | 63                      | 19950                  | 82111                  |
| 18000                   | 25,92  | -                       | 56                      | 20039                  | 85446                  |
| 18000                   | 33,93  | -                       | 43                      | 22918                  | 100000                 |
| 18000                   | 38,24  | -                       | 38                      | 23163                  | 100000                 |
| 18000                   | 43,38  | -                       | 33                      | 23390                  | 100000                 |
| 18000                   | 50,12  | -                       | 29                      | 24913                  | 100000                 |
| 18000                   | 56,21  | -                       | 26                      | 25074                  | 100000                 |
| 18000                   | 63,36  | -                       | 23                      | 25222                  | 100000                 |
| 18000                   | 71,87  | -                       | 20                      | 25359                  | 100000                 |
| 18000                   | 84,31  | -                       | 17                      | 25531                  | 100000                 |
| 18000                   | 93,91  | -                       | 15                      | 25619                  | 100000                 |
| 18000                   | 105,33 | -                       | 14                      | 25702                  | 100000                 |
| 18000                   | 119,15 | -                       | 12                      | 25781                  | 100000                 |
| 18000                   | 136,23 | 41                      | 11                      | 25856                  | 100000                 |
| 18000                   | 153,87 | 37                      | 9                       | 25922                  | 100000                 |
| 18000                   | 171,00 | 33                      | 8                       | 25968                  | 100000                 |
| 18000                   | 191,74 | 29                      | 8                       | 26012                  | 100000                 |

## 5.3 ISN GEAR REDUCER - 1450 rpm

| ISN142                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 2200                    | 4,28  | 80                      | 339                     | -                      | 31593                  |
| 2370                    | 4,92  | 75                      | 295                     | -                      | 32632                  |
| 2550                    | 5,68  | 70                      | 255                     | -                      | 33765                  |
| 2580                    | 5,89  | 68                      | 246                     | -                      | 34127                  |
| 2730                    | 6,61  | 64                      | 219                     | -                      | 35083                  |
| 2880                    | 7,45  | 60                      | 195                     | -                      | 36165                  |
| 3300                    | 7,75  | 66                      | 187                     | -                      | 36215                  |
| 3540                    | 8,91  | 62                      | 163                     | -                      | 37392                  |
| 3790                    | 10,29 | 58                      | 141                     | -                      | 38694                  |
| 3830                    | 10,67 | 56                      | 136                     | -                      | 38291                  |
| 4030                    | 11,96 | 53                      | 121                     | -                      | 35135                  |
| 4250                    | 13,48 | 49                      | 108                     | -                      | 31078                  |
| 4300                    | 15,30 | 44                      | 95                      | -                      | 29600                  |
| 4300                    | 17,49 | 39                      | 83                      | -                      | 29600                  |
| 4300                    | 20,20 | 33                      | 72                      | -                      | 29600                  |
| 4300                    | 23,36 | 29                      | 62                      | -                      | 29600                  |
| 4300                    | 26,11 | 26                      | 56                      | -                      | 29600                  |

| ISN143                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 4300                    | 30,04  | 22                      | 48                      | 370                    | 29600                  |
| 4300                    | 34,02  | 20                      | 43                      | 849                    | 29600                  |
| 4300                    | 38,70  | 17                      | 37                      | 1284                   | 29600                  |
| 4300                    | 44,27  | 15                      | 33                      | 1681                   | 29600                  |
| 4300                    | 51,01  | 13                      | 28                      | 2043                   | 29600                  |
| 4300                    | 59,34  | 11                      | 24                      | 2374                   | 29600                  |
| 4300                    | 60,82  | 11                      | 24                      | 3134                   | 29600                  |
| 4300                    | 69,18  | 10                      | 21                      | 3197                   | 29600                  |
| 4300                    | 79,14  | 9                       | 18                      | 3254                   | 29600                  |
| 4300                    | 91,19  | 7                       | 16                      | 3305                   | 29600                  |
| 4300                    | 106,08 | 6                       | 14                      | 3353                   | 29600                  |
| 4300                    | 124,53 | 5                       | 12                      | 3414                   | 29600                  |
| 4300                    | 139,76 | 5                       | 10                      | 3440                   | 29600                  |
| 4300                    | 167,96 | 4                       | 9                       | 3473                   | 29600                  |
| 4300                    | 197,01 | 3                       | 7                       | 3499                   | 29600                  |
| 4300                    | 221,47 | 3                       | 7                       | 3515                   | 29600                  |

## 5.3 ISN GEAR REDUCER - 1450 rpm

| ISN152                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 3800                    | 4,47  | 132                     | 325                     | -                      | 30034                  |
| 4080                    | 5,06  | 125                     | 287                     | -                      | 30748                  |
| 4350                    | 5,75  | 118                     | 252                     | -                      | 31612                  |
| 4630                    | 6,58  | 110                     | 220                     | -                      | 32592                  |
| 4770                    | 6,97  | 107                     | 208                     | -                      | 32969                  |
| 5010                    | 7,76  | 101                     | 187                     | -                      | 33787                  |
| 5260                    | 8,70  | 94                      | 167                     | -                      | 34710                  |
| 6050                    | 9,00  | 105                     | 161                     | -                      | 34844                  |
| 6420                    | 10,23 | 98                      | 142                     | -                      | 35845                  |
| 6820                    | 11,71 | 91                      | 124                     | -                      | 36936                  |
| 7000                    | 12,40 | 88                      | 117                     | -                      | 37404                  |
| 7330                    | 13,81 | 83                      | 105                     | -                      | 38349                  |
| 7680                    | 15,46 | 78                      | 94                      | -                      | 39400                  |
| 8000                    | 17,44 | 72                      | 83                      | -                      | 40735                  |
| 8000                    | 19,82 | 63                      | 73                      | -                      | 43221                  |
| 8000                    | 22,77 | 55                      | 64                      | -                      | 46018                  |
| 4300                    | 26,11 | 26                      | 56                      | -                      | 29600                  |

| ISN153                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 5560                    | 17,95  | 48                      | 81                      | -                      | 46247                  |
| 5620                    | 18,61  | 47                      | 78                      | -                      | 46758                  |
| 5820                    | 20,87  | 43                      | 69                      | -                      | 48384                  |
| 8000                    | 24,06  | 52                      | 60                      | -                      | 47165                  |
| 8000                    | 27,65  | 45                      | 52                      | -                      | 50137                  |
| 8000                    | 31,92  | 39                      | 45                      | -                      | 53342                  |
| 8000                    | 33,10  | 38                      | 44                      | -                      | 54175                  |
| 8000                    | 37,12  | 34                      | 39                      | -                      | 55500                  |
| 8000                    | 41,85  | 30                      | 35                      | -                      | 55500                  |
| 8000                    | 46,99  | 27                      | 31                      | 2038                   | 55500                  |
| 8000                    | 53,99  | 23                      | 27                      | 2582                   | 55500                  |
| 8000                    | 62,33  | 20                      | 23                      | 3029                   | 55500                  |
| 8000                    | 64,64  | 19                      | 22                      | 3039                   | 55500                  |
| 8000                    | 72,50  | 17                      | 20                      | 3122                   | 55500                  |
| 8000                    | 81,72  | 15                      | 18                      | 3199                   | 55500                  |
| 8000                    | 92,70  | 14                      | 16                      | 3270                   | 55500                  |
| 8000                    | 105,99 | 12                      | 14                      | 3335                   | 55500                  |
| 8000                    | 122,41 | 10                      | 12                      | 3396                   | 55500                  |

## 5.3 ISN GEAR REDUCER - 1450 rpm

| ISN153                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 8000                    | 141,55 | 9                       | 10                      | 3469                   | 55500                  |
| 8000                    | 158,23 | 8                       | 9                       | 3504                   | 55500                  |
| 8000                    | 190,20 | 7                       | 8                       | 3555                   | 55500                  |
| 8000                    | 222,16 | 6                       | 7                       | 3590                   | 55500                  |

| ISN162                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 6660                    | 5,66  | 183                     | 256                     | -                      | 24062                  |
| 7040                    | 6,35  | 172                     | 228                     | -                      | 28406                  |
| 7440                    | 7,16  | 162                     | 202                     | -                      | 33157                  |
| 7870                    | 8,12  | 151                     | 179                     | -                      | 38380                  |
| 9130                    | 8,75  | 162                     | 166                     | -                      | 41694                  |
| 9610                    | 9,78  | 153                     | 148                     | -                      | 46426                  |
| 10120                   | 10,97 | 144                     | 132                     | -                      | 51518                  |
| 10660                   | 12,36 | 135                     | 117                     | -                      | 57074                  |
| 11250                   | 14,02 | 125                     | 103                     | -                      | 63142                  |

| ISN163                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 6660                    | 5,66   | 183                     | 256                     | -                      | 24062                  |
| 10550                   | 15,45  | 106                     | 94                      | -                      | 66375                  |
| 11000                   | 17,67  | 97                      | 82                      | -                      | 69064                  |
| 13000                   | 23,44  | 86                      | 62                      | -                      | 76000                  |
| 13000                   | 26,66  | 76                      | 54                      | -                      | 76000                  |
| 13000                   | 30,50  | 67                      | 48                      | -                      | 76000                  |
| 13000                   | 35,24  | 57                      | 41                      | -                      | 76000                  |
| 13000                   | 39,92  | 51                      | 36                      | 1134                   | 76000                  |
| 13000                   | 45,41  | 45                      | 32                      | 1938                   | 76000                  |
| 13000                   | 51,94  | 39                      | 28                      | 2678                   | 76000                  |
| 13000                   | 55,01  | 37                      | 26                      | 3038                   | 76000                  |
| 13000                   | 61,27  | 33                      | 24                      | 3530                   | 76000                  |
| 13000                   | 68,62  | 30                      | 21                      | 3992                   | 76000                  |
| 13000                   | 77,36  | 26                      | 19                      | 4424                   | 76000                  |
| 13000                   | 87,95  | 23                      | 16                      | 4829                   | 76000                  |
| 13000                   | 101,03 | 20                      | 14                      | 5085                   | 76000                  |
| 13000                   | 115,03 | 18                      | 13                      | 5167                   | 76000                  |
| 13000                   | 128,20 | 16                      | 11                      | 5218                   | 76000                  |

## 5.3 ISN GEAR REDUCER - 1450 rpm

| ISN182                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 6660                    | 5,66  | 183                     | 256                     | -                      | 24062                  |
| 13490                   | 7,88  | 266                     | 184                     | -                      | 57625                  |
| 14170                   | 8,82  | 250                     | 164                     | -                      | 59086                  |
| 14900                   | 9,94  | 233                     | 146                     | -                      | 60730                  |
| 17920                   | 11,85 | 236                     | 122                     | -                      | 63010                  |
| 18000                   | 13,19 | 213                     | 110                     | -                      | 66171                  |
| 18000                   | 14,77 | 190                     | 98                      | -                      | 69795                  |
| 18000                   | 16,64 | 169                     | 87                      | -                      | 73773                  |

| ISN183                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 6660                    | 5,66   | 183                     | 256                     | -                      | 24062                  |
| 17400                   | 22,85  | 118                     | 63                      | 19950                  | 82111                  |
| 18000                   | 25,92  | 108                     | 56                      | 20039                  | 85446                  |
| 18000                   | 33,93  | 83                      | 43                      | 22918                  | 100000                 |
| 18000                   | 38,24  | 73                      | 38                      | 23163                  | 100000                 |
| 18000                   | 43,38  | 65                      | 33                      | 23390                  | 100000                 |
| 18000                   | 50,12  | 56                      | 29                      | 24913                  | 100000                 |
| 18000                   | 56,21  | 50                      | 26                      | 25074                  | 100000                 |
| 18000                   | 63,36  | 44                      | 23                      | 25222                  | 100000                 |
| 18000                   | 71,87  | 39                      | 20                      | 25359                  | 100000                 |
| 18000                   | 84,31  | 33                      | 17                      | 25531                  | 100000                 |
| 18000                   | 93,91  | 30                      | 15                      | 25619                  | 100000                 |
| 18000                   | 105,33 | 27                      | 14                      | 25702                  | 100000                 |
| 18000                   | 119,15 | 24                      | 12                      | 25781                  | 100000                 |
| 18000                   | 136,23 | 21                      | 11                      | 25856                  | 100000                 |
| 18000                   | 153,87 | 18                      | 9                       | 25922                  | 100000                 |
| 18000                   | 171,00 | 17                      | 8                       | 25968                  | 100000                 |
| 18000                   | 191,74 | 15                      | 8                       | 26012                  | 100000                 |

## 5.4 ISN GEAR REDUCER - 950 rpm

| ISN142                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 6660                    | 5,66  | 183                     | 256                     | -                      | 24062                  |
| 2370                    | 4,92  | 56                      | 295                     | -                      | 32632                  |
| 2550                    | 5,68  | 52                      | 255                     | -                      | 33765                  |
| 2580                    | 5,89  | 51                      | 246                     | -                      | 34127                  |
| 2730                    | 6,61  | 48                      | 219                     | -                      | 35083                  |
| 2880                    | 7,45  | 45                      | 195                     | -                      | 36165                  |
| 3300                    | 7,75  | 50                      | 187                     | -                      | 36215                  |
| 3540                    | 8,91  | 46                      | 163                     | -                      | 37392                  |
| 3790                    | 10,29 | 43                      | 141                     | -                      | 38694                  |
| 3830                    | 10,67 | 41                      | 136                     | -                      | 38291                  |
| 4030                    | 11,96 | 37                      | 121                     | -                      | 35135                  |
| 4250                    | 13,48 | 33                      | 108                     | -                      | 31078                  |
| 4300                    | 15,30 | 29                      | 95                      | -                      | 29600                  |
| 4300                    | 17,49 | 25                      | 83                      | -                      | 29600                  |
| 4300                    | 20,20 | 22                      | 72                      | -                      | 29600                  |
| 4300                    | 23,36 | 19                      | 62                      | -                      | 29600                  |
| 4300                    | 26,11 | 17                      | 56                      | -                      | 29600                  |

| ISN143                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 6660                    | 5,66   | 183                     | 256                     | -                      | 24062                  |
| 4300                    | 34,02  | 13                      | 43                      | 849                    | 29600                  |
| 4300                    | 38,70  | 11                      | 37                      | 1284                   | 29600                  |
| 4300                    | 44,27  | 10                      | 33                      | 1681                   | 29600                  |
| 4300                    | 51,01  | 9                       | 28                      | 2043                   | 29600                  |
| 4300                    | 59,34  | 7                       | 24                      | 2374                   | 29600                  |
| 4300                    | 60,82  | 7                       | 24                      | 3134                   | 29600                  |
| 4300                    | 69,18  | 6                       | 21                      | 3197                   | 29600                  |
| 4300                    | 79,14  | 6                       | 18                      | 3254                   | 29600                  |
| 4300                    | 91,19  | 5                       | 16                      | 3305                   | 29600                  |
| 4300                    | 106,08 | 4                       | 14                      | 3353                   | 29600                  |
| 4300                    | 124,53 | 4                       | 12                      | 3414                   | 29600                  |
| 4300                    | 139,76 | 3                       | 10                      | 3440                   | 29600                  |
| 4300                    | 167,96 | 3                       | 9                       | 3473                   | 29600                  |
| 4300                    | 197,01 | 2                       | 7                       | 3499                   | 29600                  |
| 4300                    | 221,47 | 2                       | 7                       | 3515                   | 29600                  |



## 5.4 ISN GEAR REDUCER - 950 rpm

| ISN152                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 6660                    | 5,66  | 183                     | 256                     | -                      | 24062                  |
| 4080                    | 5,06  | 94                      | 287                     | -                      | 30748                  |
| 4350                    | 5,75  | 88                      | 252                     | -                      | 31612                  |
| 4630                    | 6,58  | 82                      | 220                     | -                      | 32592                  |
| 4770                    | 6,97  | 80                      | 208                     | -                      | 32969                  |
| 5010                    | 7,76  | 75                      | 187                     | -                      | 33787                  |
| 5260                    | 8,70  | 71                      | 167                     | -                      | 34710                  |
| 6050                    | 9,00  | 79                      | 161                     | -                      | 34844                  |
| 6420                    | 10,23 | 73                      | 142                     | -                      | 35845                  |
| 6820                    | 11,71 | 68                      | 124                     | -                      | 36936                  |
| 7000                    | 12,40 | 66                      | 117                     | -                      | 37404                  |
| 7330                    | 13,81 | 60                      | 105                     | -                      | 38349                  |
| 7680                    | 15,46 | 53                      | 94                      | -                      | 39400                  |
| 8000                    | 17,44 | 47                      | 83                      | -                      | 40735                  |
| 8000                    | 19,82 | 42                      | 73                      | -                      | 43221                  |
| 8000                    | 22,77 | 36                      | 64                      | -                      | 46018                  |

| ISN153                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 6660                    | 5,66   | 183                     | 256                     | -                      | 24062                  |
| 5620                    | 18,61  | 35                      | 78                      | -                      | 46758                  |
| 5820                    | 20,87  | 33                      | 69                      | -                      | 48384                  |
| 8000                    | 24,06  | 34                      | 60                      | -                      | 47165                  |
| 8000                    | 27,65  | 30                      | 52                      | -                      | 50137                  |
| 8000                    | 31,92  | 26                      | 45                      | -                      | 53342                  |
| 8000                    | 33,10  | 25                      | 44                      | -                      | 54175                  |
| 8000                    | 37,12  | 22                      | 39                      | -                      | 55500                  |
| 8000                    | 41,85  | 20                      | 35                      | -                      | 55500                  |
| 8000                    | 46,99  | 17                      | 31                      | 2038                   | 55500                  |
| 8000                    | 53,99  | 15                      | 27                      | 2582                   | 55500                  |
| 8000                    | 62,33  | 13                      | 23                      | 3029                   | 55500                  |
| 8000                    | 64,64  | 13                      | 22                      | 3039                   | 55500                  |
| 8000                    | 72,50  | 11                      | 20                      | 3122                   | 55500                  |
| 8000                    | 81,72  | 10                      | 18                      | 3199                   | 55500                  |
| 8000                    | 92,70  | 9                       | 16                      | 3270                   | 55500                  |
| 8000                    | 105,99 | 8                       | 14                      | 3335                   | 55500                  |
| 8000                    | 122,41 | 7                       | 12                      | 3396                   | 55500                  |
| 8000                    | 141,55 | 6                       | 10                      | 3469                   | 55500                  |

## 5.4 ISN GEAR REDUCER - 950 rpm

| ISN153                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 8000                    | 158,23 | 5                       | 9                       | 3504                   | 55500                  |
| 8000                    | 190,20 | 4                       | 8                       | 3555                   | 55500                  |
| 8000                    | 222,16 | 4                       | 7                       | 3590                   | 55500                  |

| ISN162                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 6660                    | 5,66  | 137                     | 256                     | -                      | 24062                  |
| 7040                    | 6,35  | 129                     | 228                     | -                      | 28406                  |
| 7440                    | 7,16  | 121                     | 202                     | -                      | 33157                  |
| 7870                    | 8,12  | 113                     | 179                     | -                      | 38380                  |
| 9130                    | 8,75  | 122                     | 166                     | -                      | 41694                  |
| 9610                    | 9,78  | 115                     | 148                     | -                      | 46426                  |
| 10120                   | 10,97 | 108                     | 132                     | -                      | 51518                  |
| 10660                   | 12,36 | 101                     | 117                     | -                      | 57074                  |
| 11250                   | 14,02 | 94                      | 103                     | -                      | 63142                  |
| 10150                   | 13,58 | 87                      | 107                     | -                      | 60141                  |

| ISN163                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 10550                   | 15,45  | 80                      | 94                      | -                      | 66375                  |
| 11000                   | 17,67  | 73                      | 82                      | -                      | 69064                  |
| 13000                   | 23,44  | 57                      | 62                      | -                      | 76000                  |
| 13000                   | 26,66  | 50                      | 54                      | -                      | 76000                  |
| 13000                   | 30,50  | 44                      | 48                      | -                      | 76000                  |
| 13000                   | 35,24  | 38                      | 41                      | -                      | 76000                  |
| 13000                   | 39,92  | 33                      | 36                      | 1134                   | 76000                  |
| 13000                   | 45,41  | 29                      | 32                      | 1938                   | 76000                  |
| 13000                   | 51,94  | 26                      | 28                      | 2678                   | 76000                  |
| 13000                   | 55,01  | 24                      | 26                      | 3038                   | 76000                  |
| 13000                   | 61,27  | 22                      | 24                      | 3530                   | 76000                  |
| 13000                   | 68,62  | 19                      | 21                      | 3992                   | 76000                  |
| 13000                   | 77,36  | 17                      | 19                      | 4424                   | 76000                  |
| 13000                   | 87,95  | 15                      | 16                      | 4829                   | 76000                  |
| 13000                   | 101,03 | 13                      | 14                      | 5085                   | 76000                  |
| 13000                   | 115,03 | 12                      | 13                      | 5167                   | 76000                  |
| 13000                   | 128,20 | 10                      | 11                      | 5218                   | 76000                  |

## 5.4 ISN GEAR REDUCER - 950 rpm

| ISN182                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 12860                   | 7,08  | 211                     | 205                     | -                      | 56290                  |
| 13490                   | 7,88  | 199                     | 184                     | -                      | 57625                  |
| 14170                   | 8,82  | 187                     | 164                     | -                      | 59086                  |
| 14900                   | 9,94  | 175                     | 146                     | -                      | 60730                  |
| 17920                   | 11,85 | 156                     | 122                     | -                      | 63010                  |
| 18000                   | 13,19 | 140                     | 110                     | -                      | 66171                  |
| 18000                   | 14,77 | 125                     | 98                      | -                      | 69795                  |
| 18000                   | 16,64 | 111                     | 87                      | -                      | 73773                  |

| ISN183                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 16800                   | 20,27  | 91                      | 72                      | 19858                  | 79179                  |
| 17400                   | 22,85  | 81                      | 63                      | 19950                  | 82111                  |
| 18000                   | 25,92  | 71                      | 56                      | 20039                  | 85446                  |
| 18000                   | 33,93  | 54                      | 43                      | 22918                  | 100000                 |
| 18000                   | 38,24  | 48                      | 38                      | 23163                  | 100000                 |
| 18000                   | 43,38  | 43                      | 33                      | 23390                  | 100000                 |
| 18000                   | 50,12  | 37                      | 29                      | 24913                  | 100000                 |
| 18000                   | 56,21  | 33                      | 26                      | 25074                  | 100000                 |
| 18000                   | 63,36  | 29                      | 23                      | 25222                  | 100000                 |
| 18000                   | 71,87  | 26                      | 20                      | 25359                  | 100000                 |
| 18000                   | 84,31  | 22                      | 17                      | 25531                  | 100000                 |
| 18000                   | 93,91  | 20                      | 15                      | 25619                  | 100000                 |
| 18000                   | 105,33 | 18                      | 14                      | 25702                  | 100000                 |
| 18000                   | 119,15 | 16                      | 12                      | 25781                  | 100000                 |
| 18000                   | 136,23 | 14                      | 11                      | 25856                  | 100000                 |
| 18000                   | 153,87 | 12                      | 9                       | 25922                  | 100000                 |
| 18000                   | 171,00 | 11                      | 8                       | 25968                  | 100000                 |
| 18000                   | 191,74 | 10                      | 8                       | 26012                  | 100000                 |

| ISN142                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 2200                    | 4,28  | 48                      | 339                     | -                      | 31593                  |
| 2370                    | 4,92  | 45                      | 295                     | -                      | 32632                  |
| 2550                    | 5,68  | 42                      | 255                     | -                      | 33765                  |
| 2580                    | 5,89  | 41                      | 246                     | -                      | 34127                  |
| 2730                    | 6,61  | 39                      | 219                     | -                      | 35083                  |
| 2880                    | 7,45  | 37                      | 195                     | -                      | 36165                  |
| 3300                    | 7,75  | 40                      | 187                     | -                      | 36215                  |
| 3540                    | 8,91  | 38                      | 163                     | -                      | 37392                  |
| 3790                    | 10,29 | 33                      | 141                     | -                      | 38694                  |
| 3830                    | 10,67 | 32                      | 136                     | -                      | 38291                  |
| 4030                    | 11,96 | 28                      | 121                     | -                      | 35135                  |
| 4250                    | 13,48 | 25                      | 108                     | -                      | 31078                  |
| 4300                    | 15,30 | 22                      | 95                      | -                      | 29600                  |
| 4300                    | 17,49 | 19                      | 83                      | -                      | 29600                  |
| 4300                    | 20,20 | 17                      | 72                      | -                      | 29600                  |
| 4300                    | 23,36 | 15                      | 62                      | -                      | 29600                  |
| 4300                    | 26,11 | 13                      | 56                      | -                      | 29600                  |

| ISN143                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 4300                    | 30,04  | 11                      | 48                      | 370                    | 29600                  |
| 4300                    | 34,02  | 10                      | 43                      | 849                    | 29600                  |
| 4300                    | 38,70  | 9                       | 37                      | 1284                   | 29600                  |
| 4300                    | 44,27  | 8                       | 33                      | 1681                   | 29600                  |
| 4300                    | 51,01  | 7                       | 28                      | 2043                   | 29600                  |
| 4300                    | 59,34  | 6                       | 24                      | 2374                   | 29600                  |
| 4300                    | 60,82  | 6                       | 24                      | 3134                   | 29600                  |
| 4300                    | 69,18  | 5                       | 21                      | 3197                   | 29600                  |
| 4300                    | 79,14  | 4                       | 18                      | 3254                   | 29600                  |
| 4300                    | 91,19  | 4                       | 16                      | 3305                   | 29600                  |
| 4300                    | 106,08 | 3                       | 14                      | 3353                   | 29600                  |
| 4300                    | 124,53 | 3                       | 12                      | 3414                   | 29600                  |
| 4300                    | 139,76 | 2                       | 10                      | 3440                   | 29600                  |
| 4300                    | 167,96 | 2                       | 9                       | 3473                   | 29600                  |
| 4300                    | 197,01 | 2                       | 7                       | 3499                   | 29600                  |
| 4300                    | 221,47 | 2                       | 7                       | 3515                   | 29600                  |

| ISN152                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 3800                    | 4,47  | 80                      | 325                     | -                      | 30034                  |
| 4080                    | 5,06  | 76                      | 287                     | -                      | 30748                  |
| 4350                    | 5,75  | 71                      | 252                     | -                      | 31612                  |
| 4630                    | 6,58  | 66                      | 220                     | -                      | 32592                  |
| 4770                    | 6,97  | 64                      | 208                     | -                      | 32969                  |
| 5010                    | 7,76  | 61                      | 187                     | -                      | 33787                  |
| 5260                    | 8,70  | 57                      | 167                     | -                      | 34710                  |
| 6050                    | 9,00  | 63                      | 161                     | -                      | 34844                  |
| 6420                    | 10,23 | 59                      | 142                     | -                      | 35845                  |
| 6820                    | 11,71 | 54                      | 124                     | -                      | 36936                  |
| 7000                    | 12,40 | 51                      | 117                     | -                      | 37404                  |
| 7330                    | 13,81 | 46                      | 105                     | -                      | 38349                  |
| 7680                    | 15,46 | 41                      | 94                      | -                      | 39400                  |
| 8000                    | 17,44 | 36                      | 83                      | -                      | 40735                  |
| 8000                    | 19,82 | 32                      | 73                      | -                      | 43221                  |
| 8000                    | 22,77 | 28                      | 64                      | -                      | 46018                  |

| ISN153                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 5560                    | 17,95  | 29                      | 81                      | -                      | 46247                  |
| 5620                    | 18,61  | 28                      | 78                      | -                      | 46758                  |
| 5820                    | 20,87  | 26                      | 69                      | -                      | 48384                  |
| 8000                    | 24,06  | 26                      | 60                      | -                      | 47165                  |
| 8000                    | 27,65  | 23                      | 52                      | -                      | 50137                  |
| 8000                    | 31,92  | 20                      | 45                      | -                      | 53342                  |
| 8000                    | 33,10  | 19                      | 44                      | -                      | 54175                  |
| 8000                    | 37,12  | 17                      | 39                      | -                      | 55500                  |
| 8000                    | 41,85  | 15                      | 35                      | -                      | 55500                  |
| 8000                    | 46,99  | 13                      | 31                      | 2038                   | 55500                  |
| 8000                    | 53,99  | 12                      | 27                      | 2582                   | 55500                  |
| 8000                    | 62,33  | 10                      | 23                      | 3029                   | 55500                  |
| 8000                    | 64,64  | 10                      | 22                      | 3039                   | 55500                  |
| 8000                    | 72,50  | 9                       | 20                      | 3122                   | 55500                  |
| 8000                    | 81,72  | 8                       | 18                      | 3199                   | 55500                  |
| 8000                    | 92,70  | 7                       | 16                      | 3270                   | 55500                  |
| 8000                    | 105,99 | 6                       | 14                      | 3335                   | 55500                  |
| 8000                    | 122,41 | 5                       | 12                      | 3396                   | 55500                  |
| 8000                    | 141,55 | 4                       | 10                      | 3469                   | 55500                  |

| ISN153                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 8000                    | 158,23 | 4                       | 9                       | 3504                   | 55500                  |
| 8000                    | 190,20 | 3                       | 8                       | 3555                   | 55500                  |
| 8000                    | 222,16 | 3                       | 7                       | 3590                   | 55500                  |

| ISN162                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 6660                    | 5,66  | 110                     | 256                     | -                      | 24062                  |
| 7040                    | 6,35  | 104                     | 228                     | -                      | 28406                  |
| 7440                    | 7,16  | 98                      | 202                     | -                      | 33157                  |
| 7870                    | 8,12  | 91                      | 179                     | -                      | 38380                  |
| 9130                    | 8,75  | 98                      | 166                     | -                      | 41694                  |
| 9610                    | 9,78  | 93                      | 148                     | -                      | 46426                  |
| 10120                   | 10,97 | 87                      | 132                     | -                      | 51518                  |
| 10660                   | 12,36 | 81                      | 117                     | -                      | 57074                  |
| 11250                   | 14,02 | 73                      | 103                     | -                      | 63142                  |

| ISN163                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 10150                   | 13,58  | 70                      | 107                     | -                      | 60141                  |
| 10550                   | 15,45  | 64                      | 94                      | -                      | 66375                  |
| 11000                   | 17,67  | 58                      | 82                      | -                      | 69064                  |
| 13000                   | 23,44  | 43                      | 62                      | -                      | 76000                  |
| 13000                   | 26,66  | 38                      | 54                      | -                      | 76000                  |
| 13000                   | 30,50  | 33                      | 48                      | -                      | 76000                  |
| 13000                   | 35,24  | 29                      | 41                      | -                      | 76000                  |
| 13000                   | 39,92  | 26                      | 36                      | 1134                   | 76000                  |
| 13000                   | 45,41  | 22                      | 32                      | 1938                   | 76000                  |
| 13000                   | 51,94  | 20                      | 28                      | 2678                   | 76000                  |
| 13000                   | 55,01  | 19                      | 26                      | 3038                   | 76000                  |
| 13000                   | 61,27  | 17                      | 24                      | 3530                   | 76000                  |
| 13000                   | 68,62  | 15                      | 21                      | 3992                   | 76000                  |
| 13000                   | 77,36  | 13                      | 19                      | 4424                   | 76000                  |
| 13000                   | 87,95  | 12                      | 16                      | 4829                   | 76000                  |
| 13000                   | 101,03 | 10                      | 14                      | 5085                   | 76000                  |
| 13000                   | 115,03 | 9                       | 13                      | 5167                   | 76000                  |
| 13000                   | 128,20 | 8                       | 11                      | 5218                   | 76000                  |

| ISN182                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 12860                   | 7,08  | 171                     | 205                     | -                      | 56290                  |
| 13490                   | 7,88  | 161                     | 184                     | -                      | 57625                  |
| 14170                   | 8,82  | 151                     | 164                     | -                      | 59086                  |
| 14900                   | 9,94  | 141                     | 146                     | -                      | 60730                  |
| 17920                   | 11,85 | 119                     | 122                     | -                      | 63010                  |
| 18000                   | 13,19 | 107                     | 110                     | -                      | 66171                  |
| 18000                   | 14,77 | 96                      | 98                      | -                      | 69795                  |
| 18000                   | 16,64 | 85                      | 87                      | -                      | 73773                  |

| ISN183                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 16800                   | 20,27  | 69                      | 72                      | 19858                  | 79179                  |
| 17400                   | 22,85  | 62                      | 63                      | 19950                  | 82111                  |
| 18000                   | 25,92  | 54                      | 56                      | 20039                  | 85446                  |
| 18000                   | 33,93  | 42                      | 43                      | 22918                  | 100000                 |
| 18000                   | 38,24  | 37                      | 38                      | 23163                  | 100000                 |
| 18000                   | 43,38  | 33                      | 33                      | 23390                  | 100000                 |
| 18000                   | 50,12  | 28                      | 29                      | 24913                  | 100000                 |
| 18000                   | 56,21  | 25                      | 26                      | 25074                  | 100000                 |
| 18000                   | 63,36  | 22                      | 23                      | 25222                  | 100000                 |
| 18000                   | 71,87  | 20                      | 20                      | 25359                  | 100000                 |
| 18000                   | 84,31  | 17                      | 17                      | 25531                  | 100000                 |
| 18000                   | 93,91  | 15                      | 15                      | 25619                  | 100000                 |
| 18000                   | 105,33 | 13                      | 14                      | 25702                  | 100000                 |
| 18000                   | 119,15 | 12                      | 12                      | 25781                  | 100000                 |
| 18000                   | 136,23 | 10                      | 11                      | 25856                  | 100000                 |
| 18000                   | 153,87 | 9                       | 9                       | 25922                  | 100000                 |
| 18000                   | 171,00 | 8                       | 8                       | 25968                  | 100000                 |
| 18000                   | 191,74 | 7                       | 8                       | 26012                  | 100000                 |

## 5.6 ISN GEAR REDUCER - 475 rpm

| ISN142                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 2200                    | 4,28  | 37                      | 339                     | -                      | 31593                  |
| 2370                    | 4,92  | 35                      | 295                     | -                      | 32632                  |
| 2550                    | 5,68  | 32                      | 255                     | -                      | 33765                  |
| 2580                    | 5,89  | 31                      | 246                     | -                      | 34127                  |
| 2730                    | 6,61  | 30                      | 219                     | -                      | 35083                  |
| 2880                    | 7,45  | 28                      | 195                     | -                      | 36165                  |
| 3300                    | 7,75  | 29                      | 187                     | -                      | 36215                  |
| 3540                    | 8,91  | 25                      | 163                     | -                      | 37392                  |
| 3790                    | 10,29 | 22                      | 141                     | -                      | 38694                  |
| 3830                    | 10,67 | 21                      | 136                     | -                      | 38291                  |
| 4030                    | 11,96 | 19                      | 121                     | -                      | 35135                  |
| 4250                    | 13,48 | 16                      | 108                     | -                      | 31078                  |
| 4300                    | 15,30 | 15                      | 95                      | -                      | 29600                  |
| 4300                    | 17,49 | 13                      | 83                      | -                      | 29600                  |
| 4300                    | 20,20 | 11                      | 72                      | -                      | 29600                  |
| 4300                    | 23,36 | 10                      | 62                      | -                      | 29600                  |
| 4300                    | 26,11 | 9                       | 56                      | -                      | 29600                  |

| ISN143                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 4300                    | 30,04  | 7                       | 48                      | 370                    | 29600                  |
| 4300                    | 34,02  | 7                       | 43                      | 849                    | 29600                  |
| 4300                    | 38,70  | 6                       | 37                      | 1284                   | 29600                  |
| 4300                    | 44,27  | 5                       | 33                      | 1681                   | 29600                  |
| 4300                    | 51,01  | 4                       | 28                      | 2043                   | 29600                  |
| 4300                    | 59,34  | 4                       | 24                      | 2374                   | 29600                  |
| 4300                    | 60,82  | 4                       | 24                      | 3134                   | 29600                  |
| 4300                    | 69,18  | 3                       | 21                      | 3197                   | 29600                  |
| 4300                    | 79,14  | 3                       | 18                      | 3254                   | 29600                  |
| 4300                    | 91,19  | 2                       | 16                      | 3305                   | 29600                  |
| 4300                    | 106,08 | 2                       | 14                      | 3353                   | 29600                  |
| 4300                    | 124,53 | 2                       | 12                      | 3414                   | 29600                  |
| 4300                    | 139,76 | 2                       | 10                      | 3440                   | 29600                  |
| 4300                    | 167,96 | 1                       | 9                       | 3473                   | 29600                  |
| 4300                    | 197,01 | 1                       | 7                       | 3499                   | 29600                  |
| 4300                    | 221,47 | 1                       | 7                       | 3515                   | 29600                  |



## 5.6 ISN GEAR REDUCER - 475 rpm

| ISN152                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 3800                    | 4,47  | 61                      | 325                     | -                      | 30034                  |
| 4080                    | 5,06  | 58                      | 287                     | -                      | 30748                  |
| 4350                    | 5,75  | 54                      | 252                     | -                      | 31612                  |
| 4630                    | 6,58  | 51                      | 220                     | -                      | 32592                  |
| 4770                    | 6,97  | 49                      | 208                     | -                      | 32969                  |
| 5010                    | 7,76  | 46                      | 187                     | -                      | 33787                  |
| 5260                    | 8,70  | 44                      | 167                     | -                      | 34710                  |
| 6050                    | 9,00  | 46                      | 161                     | -                      | 34844                  |
| 6420                    | 10,23 | 40                      | 142                     | -                      | 35845                  |
| 6820                    | 11,71 | 35                      | 124                     | -                      | 36936                  |
| 7000                    | 12,40 | 33                      | 117                     | -                      | 37404                  |
| 7330                    | 13,81 | 30                      | 105                     | -                      | 38349                  |
| 7680                    | 15,46 | 27                      | 94                      | -                      | 39400                  |
| 8000                    | 17,44 | 24                      | 83                      | -                      | 40735                  |
| 8000                    | 19,82 | 21                      | 73                      | -                      | 43221                  |
| 8000                    | 22,77 | 18                      | 64                      | -                      | 46018                  |

| ISN153                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 5560                    | 17,95  | 22                      | 81                      | -                      | 46247                  |
| 5620                    | 18,61  | 22                      | 78                      | -                      | 46758                  |
| 5820                    | 20,87  | 20                      | 69                      | -                      | 48384                  |
| 8000                    | 24,06  | 17                      | 60                      | -                      | 47165                  |
| 8000                    | 27,65  | 15                      | 52                      | -                      | 50137                  |
| 8000                    | 31,92  | 13                      | 45                      | -                      | 53342                  |
| 8000                    | 33,10  | 12                      | 44                      | -                      | 54175                  |
| 8000                    | 37,12  | 11                      | 39                      | -                      | 55500                  |
| 8000                    | 41,85  | 10                      | 35                      | -                      | 55500                  |
| 8000                    | 46,99  | 9                       | 31                      | 2038                   | 55500                  |
| 8000                    | 53,99  | 8                       | 27                      | 2582                   | 55500                  |
| 8000                    | 62,33  | 7                       | 23                      | 3029                   | 55500                  |
| 8000                    | 64,64  | 6                       | 22                      | 3039                   | 55500                  |
| 8000                    | 72,50  | 6                       | 20                      | 3122                   | 55500                  |
| 8000                    | 81,72  | 5                       | 18                      | 3199                   | 55500                  |
| 8000                    | 92,70  | 4                       | 16                      | 3270                   | 55500                  |
| 8000                    | 105,99 | 4                       | 14                      | 3335                   | 55500                  |
| 8000                    | 122,41 | 3                       | 12                      | 3396                   | 55500                  |
| 8000                    | 141,55 | 3                       | 10                      | 3469                   | 55500                  |

## 5.6 ISN GEAR REDUCER - 475 rpm

| ISN153                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 8000                    | 158,23 | 3                       | 9                       | 3504                   | 55500                  |
| 8000                    | 190,20 | 2                       | 8                       | 3555                   | 55500                  |
| 8000                    | 222,16 | 2                       | 7                       | 3590                   | 55500                  |

| ISN162                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 6660                    | 5,66  | 84                      | 256                     | -                      | 24062                  |
| 7040                    | 6,35  | 80                      | 228                     | -                      | 28406                  |
| 7440                    | 7,16  | 75                      | 202                     | -                      | 33157                  |
| 7870                    | 8,12  | 70                      | 179                     | -                      | 38380                  |
| 9130                    | 8,75  | 75                      | 166                     | -                      | 41694                  |
| 9610                    | 9,78  | 68                      | 148                     | -                      | 46426                  |
| 10120                   | 10,97 | 61                      | 132                     | -                      | 51518                  |
| 10660                   | 12,36 | 54                      | 117                     | -                      | 57074                  |
| 11250                   | 14,02 | 48                      | 103                     | -                      | 63142                  |

| ISN163                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 10150                   | 13,58  | 49                      | 107                     | -                      | 60141                  |
| 10550                   | 15,45  | 43                      | 94                      | -                      | 66375                  |
| 11000                   | 17,67  | 38                      | 82                      | -                      | 69064                  |
| 13000                   | 23,44  | 29                      | 62                      | -                      | 76000                  |
| 13000                   | 26,66  | 25                      | 54                      | -                      | 76000                  |
| 13000                   | 30,50  | 22                      | 48                      | -                      | 76000                  |
| 13000                   | 35,24  | 19                      | 41                      | -                      | 76000                  |
| 13000                   | 39,92  | 17                      | 36                      | 1134                   | 76000                  |
| 13000                   | 45,41  | 15                      | 32                      | 1938                   | 76000                  |
| 13000                   | 51,94  | 13                      | 28                      | 2678                   | 76000                  |
| 13000                   | 55,01  | 12                      | 26                      | 3038                   | 76000                  |
| 13000                   | 61,27  | 11                      | 24                      | 3530                   | 76000                  |
| 13000                   | 68,62  | 10                      | 21                      | 3992                   | 76000                  |
| 13000                   | 77,36  | 9                       | 19                      | 4424                   | 76000                  |
| 13000                   | 87,95  | 8                       | 16                      | 4829                   | 76000                  |
| 13000                   | 101,03 | 7                       | 14                      | 5085                   | 76000                  |
| 13000                   | 115,03 | 6                       | 13                      | 5167                   | 76000                  |
| 13000                   | 128,20 | 5                       | 11                      | 5218                   | 76000                  |

## 5.6 ISN GEAR REDUCER - 475 rpm

| ISN182                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 12860                   | 7,08  | 130                     | 205                     | -                      | 56290                  |
| 13490                   | 7,88  | 117                     | 184                     | -                      | 57625                  |
| 14170                   | 8,82  | 105                     | 164                     | -                      | 59086                  |
| 14900                   | 9,94  | 93                      | 146                     | -                      | 60730                  |
| 17920                   | 11,85 | 78                      | 122                     | -                      | 63010                  |
| 18000                   | 13,19 | 70                      | 110                     | -                      | 66171                  |
| 18000                   | 14,77 | 63                      | 98                      | -                      | 69795                  |
| 18000                   | 16,64 | 56                      | 87                      | -                      | 73773                  |

| ISN183                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 16800                   | 20,27  | 46                      | 72                      | 19858                  | 79179                  |
| 17400                   | 22,85  | 40                      | 63                      | 19950                  | 82111                  |
| 18000                   | 25,92  | 36                      | 56                      | 20039                  | 85446                  |
| 18000                   | 33,93  | 27                      | 43                      | 22918                  | 100000                 |
| 18000                   | 38,24  | 24                      | 38                      | 23163                  | 100000                 |
| 18000                   | 43,38  | 21                      | 33                      | 23390                  | 100000                 |
| 18000                   | 50,12  | 18                      | 29                      | 24913                  | 100000                 |
| 18000                   | 56,21  | 16                      | 26                      | 25074                  | 100000                 |
| 18000                   | 63,36  | 15                      | 23                      | 25222                  | 100000                 |
| 18000                   | 71,87  | 13                      | 20                      | 25359                  | 100000                 |
| 18000                   | 84,31  | 11                      | 17                      | 25531                  | 100000                 |
| 18000                   | 93,91  | 10                      | 15                      | 25619                  | 100000                 |
| 18000                   | 105,33 | 9                       | 14                      | 25702                  | 100000                 |
| 18000                   | 119,15 | 8                       | 12                      | 25781                  | 100000                 |
| 18000                   | 136,23 | 7                       | 11                      | 25856                  | 100000                 |
| 18000                   | 153,87 | 6                       | 9                       | 25922                  | 100000                 |
| 18000                   | 171,00 | 5                       | 8                       | 25968                  | 100000                 |
| 18000                   | 191,74 | 5                       | 8                       | 26012                  | 100000                 |

| ISN142                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 2200                    | 4,28  | 30                      | 339                     | -                      | 31593                  |
| 2370                    | 4,92  | 28                      | 295                     | -                      | 32632                  |
| 2550                    | 5,68  | 26                      | 255                     | -                      | 33765                  |
| 2580                    | 5,89  | 26                      | 246                     | -                      | 34127                  |
| 2730                    | 6,61  | 24                      | 219                     | -                      | 35083                  |
| 2880                    | 7,45  | 23                      | 195                     | -                      | 36165                  |
| 3300                    | 7,75  | 22                      | 187                     | -                      | 36215                  |
| 3540                    | 8,91  | 19                      | 163                     | -                      | 37392                  |
| 3790                    | 10,29 | 16                      | 141                     | -                      | 38694                  |
| 3830                    | 10,67 | 16                      | 136                     | -                      | 38291                  |
| 4030                    | 11,96 | 14                      | 121                     | -                      | 35135                  |
| 4250                    | 13,48 | 13                      | 108                     | -                      | 31078                  |
| 4300                    | 15,30 | 11                      | 95                      | -                      | 29600                  |
| 4300                    | 17,49 | 10                      | 83                      | -                      | 29600                  |
| 4300                    | 20,20 | 8                       | 72                      | -                      | 29600                  |
| 4300                    | 23,36 | 7                       | 62                      | -                      | 29600                  |
| 4300                    | 26,11 | 6                       | 56                      | -                      | 29600                  |

| ISN143                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 4300                    | 30,04  | 6                       | 48                      | 370                    | 29600                  |
| 4300                    | 34,02  | 5                       | 43                      | 849                    | 29600                  |
| 4300                    | 38,70  | 4                       | 37                      | 1284                   | 29600                  |
| 4300                    | 44,27  | 4                       | 33                      | 1681                   | 29600                  |
| 4300                    | 51,01  | 3                       | 28                      | 2043                   | 29600                  |
| 4300                    | 59,34  | 3                       | 24                      | 2374                   | 29600                  |
| 4300                    | 60,82  | 3                       | 24                      | 3134                   | 29600                  |
| 4300                    | 69,18  | 2                       | 21                      | 3197                   | 29600                  |
| 4300                    | 79,14  | 2                       | 18                      | 3254                   | 29600                  |
| 4300                    | 91,19  | 2                       | 16                      | 3305                   | 29600                  |
| 4300                    | 106,08 | 2                       | 14                      | 3353                   | 29600                  |
| 4300                    | 124,53 | 1                       | 12                      | 3414                   | 29600                  |
| 4300                    | 139,76 | 1                       | 10                      | 3440                   | 29600                  |
| 4300                    | 167,96 | 1                       | 9                       | 3473                   | 29600                  |
| 4300                    | 197,01 | 1                       | 7                       | 3499                   | 29600                  |
| 4300                    | 221,47 | 1                       | 7                       | 3515                   | 29600                  |

## 5.7 ISN GEAR REDUCER - 360 rpm

| ISN152                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 3800                    | 4,47  | 50                      | 325                     | -                      | 30034                  |
| 4080                    | 5,06  | 47                      | 287                     | -                      | 30748                  |
| 4350                    | 5,75  | 44                      | 252                     | -                      | 31612                  |
| 4630                    | 6,58  | 41                      | 220                     | -                      | 32592                  |
| 4770                    | 6,97  | 40                      | 208                     | -                      | 32969                  |
| 5010                    | 7,76  | 37                      | 187                     | -                      | 33787                  |
| 5260                    | 8,70  | 36                      | 167                     | -                      | 34710                  |
| 6050                    | 9,00  | 35                      | 161                     | -                      | 34844                  |
| 6420                    | 10,23 | 31                      | 142                     | -                      | 35845                  |
| 6820                    | 11,71 | 27                      | 124                     | -                      | 36936                  |
| 7000                    | 12,40 | 25                      | 117                     | -                      | 37404                  |
| 7330                    | 13,81 | 23                      | 105                     | -                      | 38349                  |
| 7680                    | 15,46 | 20                      | 94                      | -                      | 39400                  |
| 8000                    | 17,44 | 18                      | 83                      | -                      | 40735                  |
| 8000                    | 19,82 | 16                      | 73                      | -                      | 43221                  |
| 8000                    | 22,77 | 14                      | 64                      | -                      | 46018                  |

| ISN153                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 5560                    | 17,95  | 17                      | 81                      | -                      | 46247                  |
| 5620                    | 18,61  | 17                      | 78                      | -                      | 46758                  |
| 5820                    | 20,87  | 15                      | 69                      | -                      | 48384                  |
| 8000                    | 24,06  | 13                      | 60                      | -                      | 47165                  |
| 8000                    | 27,65  | 11                      | 52                      | -                      | 50137                  |
| 8000                    | 31,92  | 10                      | 45                      | -                      | 53342                  |
| 8000                    | 33,10  | 9                       | 44                      | -                      | 54175                  |
| 8000                    | 37,12  | 8                       | 39                      | -                      | 55500                  |
| 8000                    | 41,85  | 8                       | 35                      | -                      | 55500                  |
| 8000                    | 46,99  | 7                       | 31                      | 2038                   | 55500                  |
| 8000                    | 53,99  | 6                       | 27                      | 2582                   | 55500                  |
| 8000                    | 62,33  | 5                       | 23                      | 3029                   | 55500                  |
| 8000                    | 64,64  | 5                       | 22                      | 3039                   | 55500                  |
| 8000                    | 72,50  | 4                       | 20                      | 3122                   | 55500                  |
| 8000                    | 81,72  | 4                       | 18                      | 3199                   | 55500                  |
| 8000                    | 92,70  | 3                       | 16                      | 3270                   | 55500                  |
| 8000                    | 105,99 | 3                       | 14                      | 3335                   | 55500                  |
| 8000                    | 122,41 | 3                       | 12                      | 3396                   | 55500                  |
| 8000                    | 141,55 | 2                       | 10                      | 3469                   | 55500                  |

## 5.7 ISN GEAR REDUCER - 360 rpm

| ISN153                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 8000                    | 158,23 | 2                       | 9                       | 3504                   | 55500                  |
| 8000                    | 190,20 | 2                       | 8                       | 3555                   | 55500                  |
| 8000                    | 222,16 | 1                       | 7                       | 3590                   | 55500                  |

| ISN162                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 6660                    | 5,66  | 69                      | 256                     | -                      | 24062                  |
| 7040                    | 6,35  | 65                      | 228                     | -                      | 28406                  |
| 7440                    | 7,16  | 61                      | 202                     | -                      | 33157                  |
| 7870                    | 8,12  | 57                      | 179                     | -                      | 38380                  |
| 9130                    | 8,75  | 58                      | 166                     | -                      | 41694                  |
| 9610                    | 9,78  | 52                      | 148                     | -                      | 46426                  |
| 10120                   | 10,97 | 46                      | 132                     | -                      | 51518                  |
| 10660                   | 12,36 | 41                      | 117                     | -                      | 57074                  |
| 11250                   | 14,02 | 36                      | 103                     | -                      | 63142                  |

| ISN163                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 10150                   | 13,58  | 37                      | 107                     | -                      | 60141                  |
| 10550                   | 15,45  | 33                      | 94                      | -                      | 66375                  |
| 11000                   | 17,67  | 29                      | 82                      | -                      | 69064                  |
| 13000                   | 23,44  | 22                      | 62                      | -                      | 76000                  |
| 13000                   | 26,66  | 19                      | 54                      | -                      | 76000                  |
| 13000                   | 30,50  | 17                      | 48                      | -                      | 76000                  |
| 13000                   | 35,24  | 14                      | 41                      | -                      | 76000                  |
| 13000                   | 39,92  | 13                      | 36                      | 1134                   | 76000                  |
| 13000                   | 45,41  | 11                      | 32                      | 1938                   | 76000                  |
| 13000                   | 51,94  | 10                      | 28                      | 2678                   | 76000                  |
| 13000                   | 55,01  | 9                       | 26                      | 3038                   | 76000                  |
| 13000                   | 61,27  | 8                       | 24                      | 3530                   | 76000                  |
| 13000                   | 68,62  | 7                       | 21                      | 3992                   | 76000                  |
| 13000                   | 77,36  | 7                       | 19                      | 4424                   | 76000                  |
| 13000                   | 87,95  | 6                       | 16                      | 4829                   | 76000                  |
| 13000                   | 101,03 | 5                       | 14                      | 5085                   | 76000                  |
| 13000                   | 115,03 | 4                       | 13                      | 5167                   | 76000                  |
| 13000                   | 128,20 | 4                       | 11                      | 5218                   | 76000                  |

## 5.7 ISN GEAR REDUCER - 360 rpm

| ISN182                  |       |                         |                         |                        |                        |
|-------------------------|-------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i     | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 12860                   | 7,08  | 99                      | 205                     | -                      | 56290                  |
| 13490                   | 7,88  | 89                      | 184                     | -                      | 57625                  |
| 14170                   | 8,82  | 80                      | 164                     | -                      | 59086                  |
| 14900                   | 9,94  | 71                      | 146                     | -                      | 60730                  |
| 17920                   | 11,85 | 59                      | 122                     | -                      | 63010                  |
| 18000                   | 13,19 | 53                      | 110                     | -                      | 66171                  |
| 18000                   | 14,77 | 48                      | 98                      | -                      | 69795                  |
| 18000                   | 16,64 | 42                      | 87                      | -                      | 73773                  |

| ISN183                  |        |                         |                         |                        |                        |
|-------------------------|--------|-------------------------|-------------------------|------------------------|------------------------|
| Mn <sub>2</sub><br>[Nm] | i      | Pn <sub>1</sub><br>[kW] | n <sub>2</sub><br>[rpm] | Fr <sub>1</sub><br>[N] | Fr <sub>2</sub><br>[N] |
| 16800                   | 20,27  | 35                      | 72                      | 19858                  | 79179                  |
| 17400                   | 22,85  | 31                      | 63                      | 19950                  | 82111                  |
| 18000                   | 25,92  | 27                      | 56                      | 20039                  | 85446                  |
| 18000                   | 33,93  | 21                      | 43                      | 22918                  | 100000                 |
| 18000                   | 38,24  | 18                      | 38                      | 23163                  | 100000                 |
| 18000                   | 43,38  | 16                      | 33                      | 23390                  | 100000                 |
| 18000                   | 50,12  | 14                      | 29                      | 24913                  | 100000                 |
| 18000                   | 56,21  | 13                      | 26                      | 25074                  | 100000                 |
| 18000                   | 63,36  | 11                      | 23                      | 25222                  | 100000                 |
| 18000                   | 71,87  | 10                      | 20                      | 25359                  | 100000                 |
| 18000                   | 84,31  | 8                       | 17                      | 25531                  | 100000                 |
| 18000                   | 93,91  | 8                       | 15                      | 25619                  | 100000                 |
| 18000                   | 105,33 | 7                       | 14                      | 25702                  | 100000                 |
| 18000                   | 119,15 | 6                       | 12                      | 25781                  | 100000                 |
| 18000                   | 136,23 | 5                       | 11                      | 25856                  | 100000                 |
| 18000                   | 153,87 | 5                       | 9                       | 25922                  | 100000                 |
| 18000                   | 171,00 | 4                       | 8                       | 25968                  | 100000                 |
| 18000                   | 191,74 | 4                       | 8                       | 26012                  | 100000                 |

**ATTENTION!**

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